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GENTLEMEN,—Syphilis is perhaps the most important and probably the most frequent cause of abortions and premature deaths. The recognition of syphilis in the stillborn fœtus, in the gravid mother, or the new-born child, is now much easier to establish than it was 12 years ago. The discovery of the *Spirochæta pallida* by Schaudinn and Hoffmann in 1905, the means of diagnosing by testing the blood for Wassermann's reaction in 1906, rapidly succeeded each other.

I quote Dr. F. W. Mott's words[1] as regards the next great advance in the pathology and treatment of syphilis.

This was "the discovery in 1909 by Ehrlich and Hata of a chemotropic substance for spirochæta and yet not organotropic—that is to say, a substance whereby the spirochæta of syphilis could be killed without injuring the tissues. By chemotropic I mean a substance that has a chemical affinity for the osmotic membrane covering the organism, but not organotropic or affinity for the osmotic membrane covering the living cells of the body. Salvarsan (606) and its arsenobenzol substitutes have this affinity for the spirochæta, and hence its spirochæticidal properties."

CONGENITAL SYPHILIS: THE INFECTION OF THE FŒTUS.

Congenital syphilis was first described by Ambroise Paré in 1633, but owing to the influence of John Hunter's teaching fell into discredit till the facts were placed on a firm footing.

There is no doubt that congenital syphilis is a more serious infection than primary syphilis, and that the treatment of congenital syphilitics is less satisfactory than in those infected primarily, and Charles Gibbs writes to me that he has never known a positive reaction in a congenital syphilitic child become negative under treatment.

There is more than a possibility that syphilis can be transmitted to the third generation. The Venereal Commission reports a case of Dr. Mott's,[2] Mr. J. E. R. McDonagh[2d] describes one in his work on Syphilis, and Mr. C. Gibbs has recently told me of one not yet ready to be published.

There are some who think that direct paternal infection of the ovum by the paternal semen, either at fertilisation or after the fertilised ovum has reached the uterus, is impossible. Most authorities think it is possible, but that it is always associated with infection of the mother—i.e., as expressed by Dr. Mott, "that every mother who gives birth to a syphilitic child is herself a syphilitic, and that every syphilitic child has a syphilitic mother."

I believe that not only is paternal infection of the ovum by the seminal fluid possible, but that it is not infrequent, and that the mother may become (1) directly infected either before or with fertilisation if she has a genital abrasion or an erosion of the cervix; or (2) indirectly infected during the pregnancy via the embryo (conceptional syphilis); or (3) there seems evidence to show that in a few cases she may be infected by the spirochætes in a granule stage, as I suggest later, and that these may develop into the mature organism after pregnancy.

More usually, however, the embryo is infected by the already infected mother, either by the infection of the ovum whilst in the Graafian follicle as part of the generalisation of the disease, or after fertilisation when burrowing in the uterine mucosa,* or by transplacental infection. Sometimes both father and mother may infect the child. Dr. Mott[6] in his article on "Syphilis of Nervous System" in the first and second edition of "Syphilis," an article to which I shall often refer, says:—

"In an overwhelming number of cases of heredo-syphilis the transmission of the disease to the offspring is directly attributable to the father. The woman in the majority of cases is infected by the man before conception or in conception, so that the child in such cases may acquire the virus from both father and mother. This is termed 'mixed transmission.'"

It is possible that some very early abortions may be the result of paternal infection of the ovum, and that the woman may have escaped infection owing to the expulsion of the ovum very soon after its fertilisation and infection,[2] before there is any true fœtal circulation.

Cases have been described by Howard Kelly[7] and J. W. Ballantyne[8] where the apparently healthy wife of a syphilitic father has had frequent abortions, but after anti-syphilitic treatment of the father alone, the subsequent pregnancies have gone on to the full term and healthy children have been born. This view is also taken by C. F. Marshall and quoted by H. Russell Andrews.[9] Marshall further says that a woman may bear a syphilitic child to a syphilitic father, and that her later children born to a second non-syphilitic husband, are not syphilitic.

I express no opinion on this point.

There is much evidence[10] that infection can take place by the semen, "although all the other secretions in the body are absolutely normal" and that "the living organism may remain latent for a long time, consequently the sperm may be infected long after the primary infection." I understand that there is difficulty in demonstrating mature spirochætes in seminal fluid.

The spirochæte in syphilitic women has been found in the female ovum, for Dr. Mott[6a] says:—

"Seeing that Levaditi, Bab, and others have seen spirochætæ in the ova it is possible that the syphilitic contagion may remain in a resting intracellular stage, but when the ovum escapes and is fertilised the syphilitic virus again becomes active, although its virulence is greatly modified and attenuated."

Syphilis as a Cause of Antenatal Death.

Syphilis is most contagious in its earliest stages, becoming less virulent in each successive year. Dr. Mott[6b] has shown that—

"Syphilitic mothers at first suffer miscarriages with dead children, then have stillbirths, then diseased children dying in early infancy, and eventually may have children showing no signs of disease, some of whom may become general paralytics at puberty, or in early adolescence."

And he goes on to explain that this usual sequence of events is due to antibodies being formed in the body of the mother, which modify the virulence of the organism.

The percentage of intra-uterine deaths from syphilis is variously estimated, though most observers agree with Mrs. Scharlieb who stated at the Royal Commission on Venereal Disease that syphilis is the commonest cause both of abortions and stillbirths.

Lady Barrett, at the same Commission, said that probably 33 per cent. of all stillbirths are due to syphilis. Dr. Russell Andrews says that nearly 50 per cent. of syphilitic fœtuses are stillborn, and of those born alive 75 per cent. die within the first year, most of them during the first few weeks of life. Dr. E. W. Hope, medical officer of health for Liverpool, has pathological proof that 16 per cent. of stillbirths are syphilitic.

Hochsinger's[11] figures are well known. Since 1869 he kept under observation 134 women who showed no signs of syphilis but had given birth to syphilitic children on 569 occasions. Of these, 253 children were stillborn (44·4 per cent.) and 316 were born alive. Of these latter, 263 were syphilitic and only 53 apparently healthy. Of the 263 syphilitics, 55 died before the fourth year. These are appalling figures.

Drs. Holt and Babbit[12] had 429 stillbirths (4·29 per cent.) in 10,000 confinements at the Sloane Hospital, New York. Of these stillbirths, only 9 per cent. were syphilitic, but no recognised cases of syphilis were admitted into hospital.

Dr. Whitridge Williams,[14] in his similar series of 10,000 cases in Johns Hopkins Hospital, had 705 deaths of children between the seventh month of pregnancy and 14 days after birth, and of these 186 (26 per cent.) were syphilitic. There were also 164 definite syphilitic infants who survived, and 53 of the "unknown" cases were macerated fœtuses which are now known to be usually syphilitic. He therefore estimates that the cases of syphilis were 4·1 per cent. of the total births and 32 per cent. of the total deaths.

My own opinion is that in city populations about 25 per cent. of stillbirths and abortions are due to syphilis. In rural districts the proportion is probably much less, and it is hardly likely that the average loss during intra-uterine life and during the first 14 days after birth would be more than 15 or 20 per cent.

I have elsewhere[28] estimated from numerous local and professional calculations made all over the world that, in addition to the total stillbirths which are known to be 3 per cent. of the total births, there are about four times as many miscarriages and abortions in the preceding seven months of

* In this connexion I would draw attention to the researches of Dr. Louise McIlroy,[3] Beckwith Whitehouse,[4] and Carl H. Browning[5] on the incidence of syphilis as shown by positive Wassermann reactions in 50, 44, and 59 per cent. respectively in women suffering from chronic metritis.

gestation. This estimate has been provisionally adopted by Sir Arthur Newsholme, medical officer of health to the Local Government Board, and would, if correct, have represented a loss of 138,000 potential lives in England and Wales during the year 1914.

If 20 per cent. of these fœtal deaths are due to syphilis, it would mean that in England and Wales about 27,000 deaths occur annually in the antenatal period and in the week following from that cause.

The next largest causes of stillbirth are from difficult and prolonged labour, variously estimated as from 17 to 45 per cent. of the total stillbirths, and from toxæmia 6 to 14 per cent. The percentage of abortions and stillbirths is twice as large in unmarried women, and about 50 per cent. of these are due to syphilis.

Dr. H. W. Hope, medical officer of health for Liverpool, states that in two large Poor-law establishments in that city the stillbirths among illegitimates were 64 per 1000 births, as compared with 30 in legitimate births, and 75 per cent. of these were due to syphilis, toxæmia, antepartum hæmorrhage, and dystocia.

As showing what may happen in fresh soil where syphilis was previously unknown amongst the natives, Dr. A. R. Cook, of Uganda, in 1912-14, where there was a terrible outbreak of syphilis, says that out of 40,000 consecutive native dispensary patients, 22 per cent. suffered from venereal disease, and that 70 per cent. of the children born either died from premature birth or were stillborn or died in the first week after birth from the effect of syphilis.

Syphilis in Macerated Stillbirths.

Tissier found evidence of syphilis in 99 out of 155 macerated fœtuses and Boissard found that 95 per cent. of all macerated fœtuses were syphilitic.

Dr. Bardley Holland,[15] who is reporting to the Local Government Board on this subject, found the spirochæte in 6 out of the first 7 stillborn fœtuses examined and in 12 out of the next 18.

Weber[16] found spirochætes in the organs of 84 per cent. of macerated fœtuses born in the later months of pregnancy. My colleague, Dr. T. W. Eden, says that in these cases "the *Spirochæta pallida* is found in the fœtal lungs in 87 per cent., pancreas 80 per cent., skin 66 per cent., suprarenals 64 per cent., spleen 62 per cent., liver 59 per cent., kidneys 54 per cent., but it is easiest to find it in the liver and spleen."

THE WASSERMANN REACTION IN PREGNANT WOMEN AND NEW-BORN LIVING SYPHILITIC CHILDREN.

Clinically syphilitic mothers give a positive reaction, even during pregnancy, but some pregnant women are negative even when they are gravid with a syphilitic fœtus. Syphilitic children are often negative at birth and for some weeks afterwards.

In a recent letter to me Dr. Mott states that apparently healthy and apparently immune pregnant women who give birth to a syphilitic child "give a positive reaction almost as frequently as the average mother of syphilitic children, and that even if negative when tested, would at one time have been positive." He quotes Knöppelmacher and Lehndorff,[17] who found "that of 91 apparently not syphilitic mothers of congenital syphilitic children, 54 (59·3 per cent.) gave a positive reaction, while in 25 mothers with certain syphilis there was a positive reaction in 18 (72 per cent.), a difference of only 12·7 per cent. These observers also found that though 90 per cent. of the mothers of syphilitic children gave a positive reaction a few months after parturition, only 50 per cent. are positive some years afterwards, and 10 per cent. of these mothers not only gave no reaction *immediately* after parturition, but remained negative."

Weber[16] states that in most cases in which the mother has presented a true Wasserman reaction he has found spirochætes in the maternal part of the placenta. Trinchese[18] states that spirochætes can usually be found in the centre of the villi of the placenta if present in the fœtal organs, but are found also in the intervillous maternal spaces and in the epithelium of the villi, showing that they can pass from the maternal to the fœtal blood stream and vice versa.

If it could be shown that, in those cases in which an apparently healthy mother bears syphilitic children and yet presents a negative Wassermann reaction spirochætes are only found in the fœtal part of the placenta, it would explain much that is obscure.

A. Shillitoe[19] says: "Many women with syphilis will give a negative reaction during pregnancy and a positive after delivery."

J. E. R. McDonagh[20] says: "Broadly speaking, the sera of women during the child-bearing period have a tendency to give negative Wassermann reactions. When the mother and embryo are infected by the contaminated semen the Wassermann reaction is often negative." He has "frequently had cases in which the mother has given birth to an undoubted syphilitic infant and yet her blood has given a negative reaction. Pregnancy no doubt retards or prevents the development of the *Leucocytozoon syphilidis* for the time being."

He continues: "Some time after a pregnancy, should another not supervene, or after the child-bearing period is over, the reaction frequently becomes positive. In some cases repeated pregnancies have undoubtedly resulted in a spontaneous cure of the disease."

In view of my suggestions regarding the action of the chorionic ferments in pregnancy these are especially interesting words.

On the same page he says: "Syphilitic infants born without symptoms of the disease may not give a positive reaction till symptoms appear."

"Commiskey[21] examined 1822 women and 1074 infants. 8 per cent. of the mothers gave positive results, and 11 mothers who gave negative reactions had children who gave either positive or doubtful reactions. 82 per cent. of the women with positive reactions had no history or evidence of disease, yet their previous history showed that 33 per cent. of the multiparæ had previous abortions, miscarriages, or stillbirths. The findings in infants would appear to be irregular and generally negative, irrespective of the findings in the mother, and might remain so for years. The death-rate amongst children in the first ten days of life was found to be four times greater in those of Wassermann positive mothers than when the mother and child were negative."

Henry Head and E. G. Fearnsides[22] describe two cases where there was a negative Wassermann reaction in the serum and a positive reaction in the cerebro-spinal fluid, and Dr. Mott tells me that this occurs in about 1 per cent. of cases of syphilis of the nervous system.

A positive Wassermann reaction does not prove infectivity in a man, neither does a negative reaction in a husband prove that he cannot infect his wife or child, for the seminal fluid, as already stated, may long remain infective, as in the following case:—

A man had syphilis six years before marriage and was well treated with mercury for three years, and was negative on two occasions some months before marriage. His wife had two stillbirths at full time, 1 year and 2½ years after marriage. Three years after marriage the apparently healthy wife consulted me, desiring to have a living child. After consultation with my colleague, Mr. Charles Gibbs, they each had a Wassermann test, and the husband was found to be still negative, but the wife strongly positive. Both are now being treated by Mr. Gibbs.

I hope my suggestions will help to explain some of the unexpected variations in Wassermann reactions during and for a short time after pregnancy.

PROBLEMS STILL REQUIRING EXPLANATION.

I want particularly to draw attention to some of the problems which have not yet been fully explained.

Problem 1.—Why are some women, gravid with a syphilitic child, negative during their pregnancy and for some time afterwards? This fact was not expected when the Wassermann test was discovered.

Problem 2.—A congenitally syphilitic child (born of such a mother) is often also negative at birth, and for some weeks or months afterwards, and may even show no clinical evidences till puberty.

Problem 3.—Why are spirochætes almost always absent in the tissues of abortions, even in abortions which are prior to or intervene between stillbirths of women known to be syphilitic, or in whose stillbirths spirochætes are found?

Problem 4.—Colles's Law.

LIFE HISTORY OF THE *Spirochæta Pallida*.

Before pointing out possible explanations of these problems I must first allude to the results of some researches into the biology of the *Spirochæta pallida*, which have been recently described and which seem to me to have important bearings on the points at issue.

To begin with, it appears to be still debatable whether the *Spirochæta pallida* is a protozoon or a bacterium, whether it is possible that spores can occur or not.

The general view is that the organism is more akin to a bacterium, but it may prove to be in a class by itself. Most observers in this country have failed to be convinced by McDonagh as to the part that sexual "spores" play in the biology of *Spirochæta pallida*. McDonagh[20b] tells us that the life-cycle of syphilis commences with a "spore," whilst the mature spirochætes are responsible for the symptoms.

Many observers have, however, described "granules" which are derived from the breaking up of the spirals of the spirochæte and which are able under certain conditions to eventually develop into the mature *Spirochæta pallida*. The granules are, therefore, spirochætes which are temporarily in a granule stage, in which stage they remain latent or biologically inactive for varying periods. I believe they are definitely infective agents capable of themselves eventually becoming mature spirochætes and may even prove to be infecting agents in some primary infections as well as in congenital.

Dr. Mott[6c] quotes the observations of O'Farrel and A. Balfour, which show "that the injection of salvarsan has the effect of causing a shedding of granules, but that this occurs also independently of the action of any drug."

These authorities consider "that this discharge of granules is protective, undertaken by the spirochætes with a view to prevent their total extinction, the granules being of the nature of resistance spores, the further history of which is unknown, but which, so far as those derived from *Spirochæta pallida* are concerned, doubtless play an important part in relapses and in the later manifestations of syphilitic infections."

Dr. Mott also quotes Noguchi,[6c] who has observed "that in pure cultures of *S.p.* under certain conditions enormous numbers of minute granules occur, and that from these granules, after transference to a

passive culture medium, spiral forms again sprout out. J. E. R. McDonagh and E. H. Ross have each described an intracellular form (leucocytozoon) and a complete sexual cycle of development of the *Spirochæta pallida*."

Dr. Mott also says that "the researches of Leishman[6d] on the spirochæte of tick fever suggest the possibility of an intracellular phase of the spiral organism and its existence in the form of infective chromidian granules. Moreover, in support of this hypothesis I may mention that Neisser, in his experimental investigations on apes, has observed that the tissues of infected animals in which no spirochætes were demonstrable could nevertheless be used effectually for inoculation. The spirochæte may be one form of the syphilitic organism, but there may be other minuter stages analogous to the spores of bacilli. These chromidian granules are contained in the *S.p.*, and in all probability serve a similar function to the nucleus in more highly developed unicellular organisms; consequently, where the mother escapes infection by the parasitic organism, and the offspring alone is infected by it, there are two possible explanations:

(*a*) The head of the spermatozoon is infected by a hypothetical syphilitic chromidian granule, which may subsequently multiply and produce the syphilitic lesions;

(*b*) If the specific organism never undergoes any modification or metamorphosis and only multiplies by longitudinal or transverse fusion, the explanation of infection would be that spirochætes contained in the sperm may remain alive in the uterus and gain ingress to the developing embryo without infecting the maternal uterus."

It is believed by Dr. Mott[6e] and others, that the *Spirochæta pallida* does undergo some modification, "so that there is a biological difference between the spirochætes of general paralysis and tabes and those of primary syphilis," but "it is unexplained when, where, and how this change has come to pass," or why the incubation or latent period should be so prolonged.

In discussing congenital syphilis as regards the sequence of abortions, stillbirths, and live children who are apparently healthy, Dr. Mott[6f] says:

"The facts show that antibodies are being continually formed in the body of the (pregnant) mother which kill off the organisms as fast as fresh broods are formed; but with each development of spirillolytic antibodies the organism is modified as regards virulence, so that the tissues of the living offspring are eventually able to cope with the disease by the same process of antibodies and spirillolysis"; and he adds that "just as the pneumococcus or tubercle bacillus may remain quiescent in the body until some depressing or devitalising condition arises, when they take on an active growth, so it is possible that the spirochæte, or a granular antecedent form, may remain latent for many years."

Taken as a whole, these observations seem to show that when attacked by salvarsan, and probably other drugs, antibodies or toxins, the spirals of the *Spirochæta pallida* may break up into granules, which may for a time remain latent, and then, unless themselves destroyed by the same agents, may develop into mature spirochætes under other circumstances at some later date.

If congenital syphilis is to be checked before it destroys the embryo it must be dealt with locally at its source, and from the very first days after fertilisation and infection.

Although antenatal death of the fœtus from syphilis is so frequent, I have always found it difficult to understand how such delicate cellular embryonic tissue can ever resist early infection, and what influence or substance it is which is able so often to arrest the progress of the disease in both mother and child during pregnancy.

Great changes go on in every organ of the body, including the ductless glands, during a healthy pregnancy, even so distant and apparently unrelated an organ as the pituitary gland developing special cells, called by Professor E. A. Schäfer "pregnancy cells." These endocrine organic changes no doubt involve altered internal secretions, and doubtless have uses and results, but they take much time to fully develop, especially in the fœtus, and can have no part in the early destruction of the spirochæte.

SUGGESTED ACTION OF THE CHORIONIC FERMENTS.

In my evidence before the Royal Commission on Venereal Diseases[23] (on March 9th, 1914), I ventured to explain the latency of syphilis during pregnancy by suggesting that the chorionic ferments might be able to injure or destroy the spirochætes. I also drew attention to the "spores" which Mr. McDonagh[20a] had described, which he believed to be the commencement of the life-cycle of the syphilitic organism, and which he thought were more resistant to the action of salvarsan than the spirochætes. I thought the "spores" might also prove to be more resistant to the action of the chorionic ferments. Even if these sexual "spores" are not confirmed, the "granules," as already described, are clearly the result of the breaking up, spontaneously or otherwise, of the spirochætes. If this can be effected by the action of the chorionic ferments, as I believe it can, syphilitic, as well, perhaps, as other infections such as tubercle, can be arrested, and in syphilis the mature organism can be prevented from passing from mother to child, or vice versa, during the pregnancy.

Just before I had finished writing this address I came across the following sentences in Mr. McDonagh's[20b] work on Syphilis (written in 1915), which show that he was being led in the same direction as myself, though he does not state that he has reached the same or any conclusion. He says:

"The later manifestations of syphilis in women are very much milder than in men; in women who are bearing children the symptoms are even milder still. From these facts one is tempted to conclude that the serum of women contains more natural protective substances than the serum of men, and that these protective substances are still further increased during pregnancy."

I believe that the chorionic ferments will be proved to be these protective substances, as I suggested in 1914. Under normal circumstances the ferments of the chorionic villi are intended for trophoblastic purposes in order to facilitate the burrowing of the fertilised ovum into the uterine mucosa at the placental site, and to promote the formation of nutritive blood-spaces by destructive action on maternal blood-vessels. The so-called "syncytial toxins" are produced by the action of the ferments upon the maternal tissues. These are controlled or neutralised by so-called syncytiolysins or by maternal antibodies, and it is believed[24] that if the syncytio-toxins are not sufficiently antagonised by these antibodies in the maternal tissues toxæmia results, and may be fatal to both mother and child.†

The intimate relations between the interdigitating fœtal and maternal portions of the placenta are such that the chemical bodies formed by the action of the syncytial ferments upon the maternal tissues penetrate easily through the thin physical barrier between mother and child, so that spirochætes in both can be similarly affected.

This thin physical barrier consists of the cells of the syncytium, and of Langhans's layers, and of the delicate walls of the small vessels on either side of these structures. It is through this maturing physical barrier that the villi can absorb from the maternal tissues all that is required for the growing embryo. This includes nourishment, and interchange of gas, oxygen, and carbon dioxide, between mother and child, from the time when the ovum is only 2 mm. long.

The chorionic ferments would be more successful in their action on the spirochæte, both in its mature and its granule stages, if the embryo was infected by the father's seminal fluid, for it would probably be a single infection. On the other hand, if the mother is already syphilitic, spirochætes would be able to invade the fœtal tissues throughout the whole of the pregnancy, and the ferments might easily fail to granulose them all.

If the mother becomes infected at the same time as the ovum her spirochætes might only become available in a few weeks, but would then continuously invade the physical barrier between mother and child, even though the ferment derivatives had destroyed the initial paternal infecting agents.

Abderhalden[25] has demonstrated the constant presence of these ferments, capable of splitting up placental albumins and placental peptones, from the sixth week of pregnancy to 10 or 15 days after delivery.

Herbert Williamson[26] agrees with Abderhalden that the early and constant presence of these ferments has provided us with a reliable method of serum diagnosis of pregnancy. Abderhalden also states that a definite maternal antibody can be demonstrated between the sixth and the fourteenth week of pregnancy, after which it disappears. This is at a time when the trophoblast is most actively engaged in invasion and destruction of the maternal tissues. He says this controlling antibody can be demonstrated by a complement-fixation test and a technique similar to that of the Wassermann test for syphilis, and Williamson suggests that the explanation of the positive reaction under both circumstances may be the outcome of a somewhat similar destructive action of both the chorionic villi and the spirochæte on the maternal tissues.

It will, I think, be found that these chorionic ferments have as destructive an action on the spirochæte as on the

† Pregnancy toxæmia may take numerous forms, amongst which may be named pernicious hyperemesis, albuminuria, eclampsia, acute yellow atrophy of the liver, toxic diabetes, toxic chorea, and insanity of pregnancy. Nothing is known of the exact causation of these various types of toxæmia. It may be due to the course taken by toxic chorionic emboli, formed sometimes of a whole villus, as has been found post mortem; by a varying or abnormal chemical constitution or excess of either syncytio-toxins or syncytio-lysins; or the type of toxæmia may be due to some functional or structural condition of one or more of the maternal organs, so that they are the more easily affected by the current toxin.

It has recently been proved that the infants of mothers who have died from eclampsia may develop similar organic changes to those found in the mother's organs, especially in the liver and kidneys.

local, probably prepared, maternal tissues, differing therefore in this latter action from that of salvarsan, which, while able to act chemically on the osmotic membrane covering the spirochæte, has no affinity for the membrane covering the living cells of the body.

I believe that not only can the ferments break up the spirochætes into granules, but that the resulting granules can in most cases, by the continued action of the ferments, be kept inactive, and powerless to develop further during the pregnancy. The ferments may even be sometimes able to destroy the granules also.

After pregnancy, in the absence of chorionic ferments, which Abderhalden[25] says can be demonstrated in the maternal blood up to the fifteenth day of the puerperium, the granules, if still present, may again become biologically active and develop into the mature organism.

CONSIDERATION OF THE FOUR PROBLEMS.

Now how do these suggestions explain the four problems named?

Problem 1.

Why may a pregnant woman, who in due course either has a stillborn or a living syphilitic child, have a negative Wassermann reaction during her pregnancy, and for some weeks afterwards?

If a woman is directly infected before or after conception her Wassermann reaction would be positive both during the pregnancy and afterwards, whether the clinical evidences are well marked or slight.

I believe this negative reaction can only occur in cases where the ovum has been infected by the father's seminal fluid, either at fertilisation, or after the fertilised ovum has reached the uterine mucosa, and where the mother has hitherto escaped direct infection. In this case the chorionic ferments may break up the infecting spirochætes, if present, into granules; if, however, the ovum is infected by the semen it is probably infected by granules, as the mature spirochæte is longer than the head of the spermatozoid. Several granules could be conveyed by a single spermatozoon.

The granules in the fœtal tissues would be kept biologically inactive, or "latent" by the continued action of the chorionic ferments, and in that case would not develop into spirochætes during the pregnancy. If so, the mother could only be infected by the granules.

After the pregnancy, 15 days after, according to Abderhalden,[25] all trace of chorionic ferments would have disappeared, and if granules were present in the maternal placenta or in the shreds of fœtal placenta which would remain adherent to it at birth, they would develop into spirochætes.

At the end of some weeks of incubation, or after a longer latent period, the woman's reaction might become positive owing to enough antibodies being produced in her body to excite a general reaction in her tissues and blood.

Problem 2.

Why are some syphilitic children negative at birth, and for some time afterwards?

Dr. Mott's[27] explanation is that—

"The negative reaction of the blood at birth and for some weeks after does not show that the infection did not take place while the child was developing in the mother's womb or during birth; the child might be born looking healthy, and it would not show signs of disease until the spirochæte had become generalised by the blood and lymph streams in all the organs and tissues of the body. The blood reaction is not shown until about six weeks after infection—that is, when the spirochætes have multiplied sufficiently in the body to have produced enough toxins to excite a general reaction of the blood and tissues. It comes just before the secondary rash appears; consequently the child might be infected during the last month of pregnancy or during its passage through the maternal genital structures at its birth."

This statement does not explain how antibodies can be thrown out in sufficient quantities in the minute embryo to resist or destroy the syphilitic infection and prevent it reaching the mother's tissue. Some other chemical agent, which must be in action at the very beginning of pregnancy and throughout its whole duration, seems to me to be required.

I believe the chorionic ferments fulfil this function. It seems probable that children who are negative at birth are the children of mothers who are negative during pregnancy and for some weeks afterwards in cases where the ovum is primarily infected by paternal semen at or soon after fertilisation. In such cases, if the paternal semen has infected the ovum by spirochætes, they are broken up by the chorionic ferments into granules, or granules may be the infecting agents, carried by the spermatozoid. In either case the granules may be prevented from further development till after the child's birth. At a variable time afterwards, when chorionic ferments are absent, spirochætes develop, antibodies are formed, and the reaction becomes positive. The only difference, in fact, in the resistance-environment of the child before birth, when its infection is latent, and after birth, when syphilis becomes active, is the absence, in the latter stage, of the protective ferments of the chorionic villi.

It is even possible that during the pregnancy of a previously syphilitic woman the chorionic ferments might prevent her spirochætes from invading the fœtal tissues, in which case the mother would have a positive reaction and the child after birth a negative. This would be a strange combination of Wassermann reactions, but Commiskey,[21] already quoted, says:

"The findings in infants are irregular, but they are generally negative, irrespective of the findings in the mother, and might remain so for years."

It is difficult to explain cases of new-born children who remain negative for more than the normal period of incubation, for I would remind you that Dr. Mott has, as you are well aware, published many cases of juvenile general paralysis and of tabes occurring in children who are "apparently" healthy in mind and body up to the age of puberty or early adolescence. I can get no information as to how long such children may remain negative after birth or how long they may have become positive before the symptoms of their nervous infection becomes evident, but such information would prove valuable and could readily be obtained if some of these "apparently healthy" children could be kept under occasional observation till tabetic symptoms appeared. McDonagh,[26] however, says that—

"Even if a syphilitic child develops no symptoms, as a rule a negative Wassermann reaction obtained soon after birth usually becomes positive about the sixth month."

Problem 3.

Why are spirochætes so rarely found in abortions, even though alternating between stillbirths in whose tissues they are swarming?

One result of this fact has been that some observers, failing to find the spirochæte, do not believe that the early abortions of syphilitic women are due to syphilis.

Thus Frantz Weber[16] has investigated a series of 300 abortions the mothers of which showed no clinical evidence of syphilis. He tried the Wassermann reaction in 67 of these women, and in 35 (52 per cent.), where abortion had occurred before the sixteenth week of pregnancy, reaction was uniformly negative, and no spirochætes were found in the embryo; in 32 cases between the sixteenth and twenty-eighth week 12 mothers gave a positive reaction, and spirochætes were found in 9 fœtuses (25 per cent.).

As already stated, F. Weber found that spirochætes were present in 84 per cent. of macerated fœtuses after the twenty-eighth week. It is not stated whether the abortions were from the same women who were delivered of macerated fœtuses, which is an important omission. Eardley Holland is reporting to the Local Government Board on this subject, and his views on the point will be awaited with interest.

It has been suggested that the reason why spirochætes are not found in abortions of the first dozen weeks of pregnancy is because the circulation is not sufficiently developed; but Professor D. Waterston writes that "in a human embryo under 3 mm. in length and *under three weeks* old, he found a well-developed primitive heart and a complete system of arterial and venous channels in its body." This evidence seems to negative the suggestion.

I would suggest that if the chorionic ferments had been able to granulose any spirochætes from either father or mother before they could infect the ovum no spirochætes in an early abortion would be discovered. Later on in pregnancy maternal spirochætes might succeed in infecting the fœtus in spite of the ferments, and the child would be stillborn with many spirochætes in its tissues, or be born alive a congenital syphilitic.

There may also be some significance in a coincidence I have noticed. Comparing Weber's[16] statement that no spirochætes were found before the sixteenth week, and only in 25 per cent. up to the twenty-eighth, there is Abderhalden's[25] statement that a definite maternal antibody is detectable only between the sixth and fourteenth week, after which date it cannot be demonstrated. Is this maternal antibody (? otherwise called syncytio-lysin) the main agent

of spirillolysis during the weeks when the trophoblast has reached its maximum development and the invasion and destruction of maternal tissues are greatest?

It is quite likely that granules, resulting from the spirillolytic action of the chorionic ferments upon the spirochætes, may be found, if carefully looked for, in the embryonic tissues of these early abortions.

Problem 4.—Colles's Law.

Colles's original statement was that a woman who gives birth to a syphilitic child does not get infected by that child after its birth, whilst the child can infect another woman—e.g., by a chancre on nipple. Colles himself made no attempt to explain his statement, but many theories have been built on this dictum.

The *words* of the "Law" as originally stated still hold good, and both Sir Jonathan Hutchinson and Fournier have stated that they have never met with an exception to it.

I am only concerned with the "Law" in regard to my suggestion.

The general view now held to explain the *words* of Colles's Law is that all these women are either infected before or during the course of their pregnancy, and cannot therefore be re-infected, "every syphilitic child having a syphilitic mother."

The Woman and Her Child under Colles's Law.

If the above explanation of the words of Colles's Law be right, the mother's clinical condition would fall into the following groups:—

1. Where a *woman* is already syphilitic before her ovum is fertilised. Such a woman would have a positive reaction throughout her pregnancy, and could not be re-infected.

The *child* in this group has already been discussed as one of the possible explanations of a child negative at birth (second case, Problem 2), protected by the chorionic ferments from the mature spirochætes of a syphilitic mother, but infected by the organism in the granule stage, and showing signs of syphilis after birth, when the absence of the ferments allows mature spirochætes to be developed.

2. Where a *woman* has a syphilitic husband who has infected the ovum at fertilisation by means of his seminal fluid. In such a case the woman might be either (*a*) or (*b*).

(*a*) Be infected at fertilisation or during the course of the pregnancy, the chorionic ferments having failed to protect her from spirochætal infection. She should have a positive reaction.

The *child* of this woman is assumed to be infected by the father's semen before or at the same time as the woman.

As soon as spirochætes become generalised in the woman the embryo or fœtus is liable to a mixed transmission, and it is not likely that the chorionic ferments would effectively protect it if the infection were virulent. The fœtus would probably be stillborn and premature, or, if it survived it would show signs of syphilis at birth, and would then, according to the Venereal Commission Report, die within the first week or so. Or,

(*b*) The *woman* resembles the case under discussion in Problem 1. She is negative during the pregnancy and for a short or longer time afterwards, and I have suggested that, owing to the action of the ferments on the infecting spirochætes, she has been infected only by granules during the pregnancy or when the fœtal placenta was separated from the maternal placenta. When her store of chorionic ferments is exhausted the spirochætic granules in her tissues may develop into the mature organism.

The *child* in this sub-group corresponds to the first child under Problem 2, negative at birth but liable to become clinically syphilitic soon after birth when the ferments have ceased to inhibit granule activity, or may remain "apparently healthy" till tabetic signs appear about puberty.

Diminishing Virulence of Infection.

As a rule the tendency is for the virulence of congenital syphilitic infection to get less marked in each successive pregnancy, though often there is much irregularity in these sequences. The above tendency can be explained by the formation of antibodies in the mother, which modify the virulence of the organism and so give the chorionic ferments a better chance of destroying them.

The irregularity of some of these congenital sequences may be due to variations in the action of the ferments, or variations in the antibodies present, or both.

CONCLUSIONS.

My suggestions seem to point to the following conclusions, some of which are scientific facts, whilst others are non-proven, but, I think, logical.

1. The "granules" are the result of the "spirillolysis" or breaking-up of the *Spirochæta pallida*.

2. The "granules" are infecting agents, being, in fact, spirochætes in the granule stage. They are able to develop into the mature spirochæte in a suitable environment, or may become biologically inactive and remain latent for short or long periods.

3. Chorionic (syncytial) ferments are present at the point of interdigitation of the fœtal and maternal portions of the placenta. Their action is primarily trophoblastic to enable the delicate chorionic villi to penetrate the uterine mucosa and to open up maternal blood-vessels, so that the ovum may find for itself a resting-place with nutritive blood-spaces around it. As a result of the destructive action of the ferments upon the maternal tissues so-called syncytio-toxins are formed, but appear to be at once neutralised by so-called syncytio-lysins. If not thus neutralised, maternal and fœtal toxæmia may become present.

4. The chorionic ferments (or their derivatives) are suggested as being capable of exercising their destructive properties upon the *Spirochæta pallida*, which may either be in the maternal intervillous or fœtal intravillous tissues, both of which are in intimate relations with the syncytial cells of the villi whence the ferments arise.

5. This destructive action of the chorionic ferments upon the spirochæte breaks it up into granules.

6. I further suggest that during pregnancy it is the continued action of the chorionic ferments upon the granules which may render them latent and biologically inactive, and perhaps in a few cases may destroy them.

7. After the pregnancy, when the chorionic ferments cease to be present in the tissues of the mother and child, the granules, wherever they may be, may develop into mature spirochætes.

8. The success or failure of the chorionic ferments to protect the mother and child from spirochætal infection would depend upon (*a*) the virulence of the infection, which tends to diminish, owing to the presence of more maternal antibodies, with each successive pregnancy; and (*b*) upon the source of the infection. Infection is probably most difficult to arrest in a "mixed transmission" or in a true maternal infection, where attempts at infection of the embryo would be constantly proceeding throughout the pregnancy. It is probably least severe and most easily countered by the ferments when the primary infection is paternal, for it may then be a single infection only, and probably not capable of repetition if the primary infection be arrested.

9. The Wassermann reaction of mother and child appears to be negative if infection has been by the spirochætes in their granule stage so long as the granules remain biologically inactive and the mature organism is absent.

This paper is the result of much thought. It consists of a series of suggestions which appear to me to explain logically some of the difficulties which now prevent a clear understanding of antenatal syphilis. At present very little is certain, and proof is difficult to obtain. Physiological and pathological chemistry is but little understood, and the presence of these ferments is difficult to demonstrate; the ferments themselves and the various toxins, lysins, and antibodies are all difficult to isolate and identify; and apparently the chemical constitution of none of them is known.

Tests of all sorts are needed to confirm or disprove my suggestions. I have not even been able to find any expert who has the time to prove experimentally, as suggested by Mr. Charles Gibbs, what is the action of the chorionic ferments upon living spirochætes outside the body. If the ferments could be shown to have a spirillolytic action on *Spirochæta pallida* outside the body it would be a scientific fact of great value, though a negative experimental result would not necessarily disprove my suggestions.

Before closing I would like to express my sincere thanks to my colleagues, Dr. F. W. Mott, F.R.S., and Mr. Charles Gibbs, for much kind help and useful criticism.

I only ask that my suggestions may receive your kind and patient consideration.

(Continued at foot of next page.)

HEART FAILURE AND PREGNANCY.

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[Dr. Amand Routh asked me to give my views in regard to the relation of heart failure to pregnancy. This brief statement is a summary of a fuller account which I intend to publish at a later date, and gives in small compass the chief results of an inquiry that I have been carrying on for a good many years.]

IT is a curious thing that authorities when dealing with heart affections carefully avoid giving a clear and definite description of what they conceive to be heart failure. The result is a prevalent idea that all abnormal signs are evidences of heart failure, for we will find such signs as murmurs and irregularities described as if they were phenomena of this nature. It must, therefore, be grasped that no cardiac murmur or irregularity is an evidence of heart failure, with the possible exception of the irregular action called pulsus alternans (which probably never occurs in pregnant women, and only when the heart failure is so extreme that the conclusion can be arrived at independently). Another idea that must be got rid of is the back pressure theory of heart failure. It is the existence of this notion that makes doctors so frightened of a mitral leak, as the regurgitant blood is supposed to flow back, and embarrass in succession the left auricle, the circulation, the lungs, and the right heart.

The part played by murmurs in relation to heart failure is limited to the fact that the presence of a murmur may indicate occasionally that the heart has been damaged by some process. As I have said, such murmurs are few and practically limited to those characteristic of mitral stenosis and aortic regurgitation. It follows that the great majority of systolic murmurs in whatever area they are heard throw no light on heart failure, and are of no significance. In the few instances when they may be helpful as evidence of a damaged valve the final decision will depend upon the manner in which the circulation is maintained.

Heart failure is essentially a question of myocardial efficiency. I am accustomed to describe the force possessed by the cardiac muscle as of two kinds, a force which maintains the circulation when the body is at rest—the rest force; and a force called into play when effort is made—the reserve force. Heart failure begins by the diminution of the reserve force, and is made manifest by a limitation of the power of the heart to respond to effort. All failing hearts show a limitation of the field of cardiac response—the first sign being the patient's consciousness that certain efforts which he used to undertake with ease and comfort now give rise to distress. But healthy hearts may show these signs when there is the added burden of pregnancy, for the condition then resembles an individual undertaking an effort with an impaired heart. It is necessary to bear this point of view in mind, because many practically healthy hearts burdened by pregnancy show distinct signs of inefficiency, and yet there is no danger. The notion that the left ventricle hypertrophies to meet the burden of pregnancy is not based upon trustworthy evidence. What does happen in every healthy woman is a limitation of the heart's power to respond to effort—a diminution of the reserve force, greater in some cases than in others. A careful investigation which I carried out in 100 women before pregnancy, during pregnancy, during confinement and the puerperium, showed no evidence of that hypertrophy which is supposed to meet the increased demands, for the increased demands were only met by calling upon the reserve force. As the growth of the abdominal tumour proceeded the diaphragm was pushed up, the sides of the chest widened, and the heart was displaced upwards and to the left, so that the apex beat was frequently felt in the fourth interspace outside the nipple line. With the emptying of the uterus the heart's position shifted to the normal position.

It is necessary to bear these facts in mind when the question arises how to deal with a woman who has become pregnant and who is supposed to have some heart failure.

While the exhaustion of the reserve force gives rise to the same symptoms whether it is a healthy heart overburdened or a heart failing from disease, it is the extent to which the signs of cardiac inefficiency go and the progress of the failure which serve as a guide. The most striking phenomena of the progress of heart failure are the onset of dropsy, breathlessness gradually increasing till the patient has to sit up, œdema of the lungs, and persistent increase of rate or violent beating of the heart on exertion.

In regard to dropsy there is this to be remembered, that it frequently occurs in pregnancy from other causes than heart failure—in kidney affections, and from pressure of the uterus upon the abdominal veins. When it is present it must not of itself be taken as an indication of a failing heart, but only when there are present the other symptoms of heart failure. It is unnecessary to insist upon orthopnœa. When this stage is reached in heart failure the sooner premature labour is induced the better. Œdema of the lungs is probably the most reliable guide. When carrying out my investigations it was my custom to begin the examination of the patient by finding out on which side she lay, and then get her to sit up, and auscultate the base of the lung on that side. In many healthy women I found during the later stages of pregnancy that the first deep inspiration was accompanied by numerous crepitations, and that the inspiration dispelled them, so that they were not heard after. In cases that did badly these crepitations did not disappear, but tended to persist, so that their continual presence, coupled with an impaired percussion note, is such a grave sign as to indicate the need for terminating the pregnancy.

Termination of the pregnancy is indicated in mitral stenosis when œdema of the lungs persists in spite of sitting up in bed or when the heart-rate is persistently over 100 with violent palpitation on the slightest effort. The dangers in aortic regurgitation are so great and yet so difficult to anticipate that I would recommend the termination of pregnancy in all cases with a "Corrigan" pulse, and when there is a distinct forcible apex-beat outside the nipple line.

This brief outline does not deal with the condition of bodily weakness, as occurs in febrile and other exhausting conditions. These introduce factors which scarcely depend on the integrity of the heart.

(*Continued from preceding page.*)

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THE LATE MR. J. A. HANRAHAN.—The death of Mr. James Hanrahan, of Hollymount, co. Mayo, removes one of the best-known and most skilful practitioners in the west of Ireland. Mr. Hanrahan qualified in 1871 at the Royal College of Surgeons in Ireland and had been for nearly 40 years medical officer to the Hollymount district. Spite of failing health he continued his work in all weathers up to a few days before his death, which was due to a sharp attack of pneumonia.

SOME POINTS IN THE DIAGNOSIS AND TREATMENT OF DYSENTERY OCCURRING IN THE BRITISH SALONIKA FORCE.[1]

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IN the first place I beg to acknowledge the very material aid given me by Captain C. G. Imrie and Captain C. P. Brown in carrying out the laboratory work, the results of which I am now reporting. I also wish to thank the past and present commanding officers, medical officers, and staff of this hospital for assistance in certain features of this investigation which demanded the coöperation of the administrative, ward, and laboratory staffs. My thanks are due to Lieutenant W. Roche, R.A.M.C., parasitologist to this area from July to November, 1916, both for controlling the microscopical examinations of specimens examined during the months from August to November, as well as instructing the laboratory staff in the diagnosis of intestinal protozoa.

The primary object of this work was to determine as accurately as possible (1) the type of dysentery affecting the troops in the British Salonika Force; (2) the percentage relationship of amœbic to bacillary dysentery; (3) the cause or causes of other forms of diarrhœa.

The investigation began in the middle of June, 1916, and has been continued up to the present time. The laboratory results reported in this paper are based on the examination of over 2500 cases suffering from dysentery or diarrhœa. All samples of fæces were examined both microscopically and bacteriologically.

Amœbic Dysentery.

Quite early in our investigations it became evident that nearly all cases of dysentery were of the bacillary type, and the later work of Lieutenant Roche has confirmed this. Three per cent. or less of the dysentery in this area has been of the amœbic type. The majority of cases of amœbic infection were of the subacute variety. One case of the acute fulminating type occurred, the patient dying eight days after the onset of the disease and a few hours after entering hospital. The motions consisted of the greyish or blackish cobweb sloughs so characteristic of this type of the disease. Post-mortem examination of this case revealed multiple perforations of the large gut, the lumen showing an acute amœbic infection involving the whole gut from the rectum to the ileo-cæcal valve.

All cases of amœbic dysentery were treated by emetine, the majority receiving 1 gr. hypodermically daily for 12 days. Six of the subacute cases, four of which had received a 12-day course of emetine hypodermically and still continued to pass cysts in their fæces, were given a course of the double iodide of bismuth and emetine, 3 gr. by mouth daily for 12 days. Cysts disappeared from the stools within 48 hours of the beginning of treatment and remained absent for three weeks after the treatment stopped, when the patients were discharged from hospital. These results, which confirm the work of Dale, Dobell, and Low, have already been reported by Captain Imrie and Lieutenant Roche.[2]

It would appear that the double iodide of bismuth and emetine is capable not only of producing a symptomatic cure of amœbic dysentery but also of freeing the intestinal tract from pathogenic amœbæ and their cysts.

Bacillary Dysentery.

The cases of bacillary dysentery occurring in this area have been divided for the purposes of description into the following groups:—(1) Severe; (2) moderately severe; (3) mild; (4) mild recurrent; (5) chronic.

Severe and moderately severe bacillary dysentery.—In the severe and moderately severe cases the onset has been sudden, and diarrhœa, very soon followed by evacuations of blood and mucus associated with pain and tenesmus, has been the characteristic symptom. The number of stools varied from 20 to 50 per day in the severe, and from 10 to 20 in the moderately severe cases. Blood and mucus were passed for 10 days or more. Collapse, toxæmia, and dehydration of the tissues were most marked in the severe form. Bacteriological examination showed that 75 per cent. were due to infection with *B. dysenteriæ* Shiga and the remainder to *B. dysenteriæ* Flexner Y. Fifty per cent. of the fatal cases were Flexner-Y infections.

Mild bacillary dysentery.—Mild bacillary dysentery differed from the preceding groups only in the degree of severity and the duration of acute symptoms. The blood and mucus stage, which was preceded by one or two days of diarrhœa, lasted from three to five days instead of ten days or more. Seventy-five per cent. were due to infection with the Flexner-Y type of dysentery bacilli and the remainder to the Shiga type.

Mild recurrent bacillary dysentery.—Mild recurrent bacillary dysentery is a type I have not found described in text-books. The cases of ordinary dysentery entering the hospital here became very much fewer after the middle of November. We then directed special attention to the study of cases diagnosed "diarrhœa." Having found during the summer, to our own satisfaction at least, that all cases passing blood and mucus of the character found in bacillary dysentery were due to an infection with a bacillus of the Shiga or Flexner-Y type, and being unsuccessful in isolating a bacillus of the dysentery group from the majority of the cases of diarrhœa giving a history of passing blood and mucus at the onset, we decided to test their agglutination reactions for dysentery bacilli. Results from this examination in over one hundred cases have proved that they are all due to infection with dysentery bacilli of the Flexner-Y group. These cases practically never entered the hospital during their primary attack, but occasionally during the second and usually during the third. The history of the first attack has been like a mild bacillary dysentery but less severe; diarrhœa followed by blood and mucus for one or two days, and then fæcal stools again. These cases have been untreated or have received a purgative, and the diarrhœa, clearing up in a few days, has been followed by a tendency to constipation. Later, they have reported to their medical officer, complaining of a similar attack associated with abdominal discomfort rather than abdominal pain, and diarrhœa with from 4 to 8 fæcal motions per day. The admission-to-hospital diagnosis has always been "diarrhœa" or "N.Y.D." Physical examination of these cases has elicited pain on light pressure over the sigmoid, splenic flexure, or descending colon. No thickening of the gut has been present. The absence of the thickening of the gut and the character of the stools have differentiated these cases from chronic bacillary dysentery. In chronic dysentery, following the incomplete healing of the acute ulceration, connective tissue is laid down in the submucosa and leads to thickening of the wall, which later may produce stricture of the gut. In the type described as mild recurrent the inflammatory reaction in the mucosa is so slight that it does not lead to connective-tissue production in the deeper layers of the gut wall. This is evident both by the history of the attack, the character of the motions passed, and the failure to find thickening of the gut on the physical examination of the patient. The recurrences so characteristic of the history of these cases have been due to the absence or lack of efficient treatment during the primary attack.

Chronic bacillary dysentery.—There have been comparatively few cases of chronic dysentery. This form is a sequel to a small percentage of severe or moderately severe bacillary dysentery, and, according to our experience, has been due to lack of proper treatment during the primary attack. The patients have usually given a history of having been in hospital suffering from an acute attack of diarrhœa associated with the passage of blood and mucus. After returning to duty they have suffered from recurring attacks of diarrhœa with slime in the motion. Physical examination of the abdomen has elicited pain on pressure over the sigmoid, splenic flexure, or descending colon; and thickening of the wall of the gut has been found. The motions have usually consisted of a thick, tenacious, greyish mucus unless the patient was suffering from an acute exacerbation, when blood and mucus were found. The infection has been due to *B. dysenteriæ* Shiga. Less severe cases due to infection with *B. dysenteriæ* Flexner Y have been seen; in these the mucus, instead of being thick and tenacious,

[1] A paper read before the Salonika Medical Society on May 9th, 1917.
[2] Jour. of R.A.M.C., xxviii., 1917, 389; THE LANCET, 1917, i., 17.

consisted of a clear transparent slime containing opaque particles about the size of sago grains, which on microscopic examination proved to be pus cells with a few endothelial and epithelial cells.

Diarrhœa.

During the present war the so-called flagellate dysentery has achieved considerable notoriety. It is looked upon by some as a definite clinical entity. The following protozoa found in this area, *Tetramitus mesnili*, *Lamblia intestinalis*, and *Trichomonas*, have been reported as etiological factors in this disease. As there is nothing absolutely characteristic about the clinical picture in these cases, we have examined their stools to see if we could find some particular characteristic apart from the mere presence of the flagellates. The results of our investigations have shown that when we exclude dysentery, hæmorrhoids, and other recognised conditions where blood may be present, red blood corpuscles have never been found in the motions passed. Further, cellular mucus has only been seen in cases from which dysentery bacilli have been isolated. There is, therefore, no justification for the diagnosis "flagellate dysentery." A fluid fæcal stool with or without a non-cellular yellow mucus has been the character of the stools examined in non-dysentery cases suffering from diarrhœa exhibiting flagellates. In fluid stools containing mucus, lamblia, when present, were found in far greater numbers in the mucous portion than in the fæcal portion, a fact already pointed out by Wenyon. This may be considered as evidence of the pathogenicity of this flagellate, but it is also possible that the mucus is a more suitable food for its growth and multiplication. Can any of the flagellates produce a fluid motion with or without mucus? It seems very doubtful. In cases of diarrhœa passing flagellates in the fæces, the diarrhœa soon disappears after an initial purge and formed motions are passed. Microscopical examination of the formed motion will show an absence of active flagellates, and probably a few cysts of lamblia or tetramitus in cases in which these flagellates were present in the original liquid motion. The tendency has been to associate the disappearance of the flagellate with the recovery of the patient and to ascribe their disappearance to the action of some particular drug used in treatment. Dobell has shown that in cases passing lamblia the various drugs described as specifics for their treatment have failed to banish them from the intestinal tract. The flagellates appear in the active form in the fæces when rapidly washed through the large gut, as in diarrhœa. If the passage of the fæces is slow through the large intestine, producing a solid stool, the active flagellates disappear and only those having a cystic stage are found—i.e., lamblia and tetramitus. If a strong saline purge, producing a liquid motion similar to the original attack of diarrhœa, is given to cases of supposed recovery active flagellates will be found, and in many cases in numbers corresponding to the first examination, proving that the cessation of the diarrhœa has not been due to the disappearance of the flagellates from the small intestine. Our observations, therefore, go to show that flagellates never produce dysentery, and that much more evidence is necessary before ascribing to them the property of being causal agents in simple diarrhœa.

What are the etiological factors in the production of diarrhœa in this area? Bacillary dysentery of the type I have termed "mild recurrent" has been responsible for a large number, but the exact percentage has not been determined. A number have appeared to be associated with bad dental conditions. In some of these a streptococcus was isolated from the fæces, and marked improvement followed dental treatment. So far, owing to the amount of other work in the dental and bacteriological laboratories, it has been impossible to give this question concentrated attention, and I merely mention the above observation for your consideration. Many cases of simple diarrhœa have macroscopic portions of meat and vegetable matter in their fæces. The diarrhœa in some of these at least was probably due to an error in diet or faulty mastication and digestion of their food. From the remaining cases of diarrhœa a number of non-lactose-fermenting strains of bacilli have been isolated, corresponding to those found in England by Lewis, Alexander, and Graham-Smith in epidemics of "summer diarrhœa" in children. The agglutination reactions of a number of patients from which these strains were isolated were tested against them, but with negative results with one exception. In this case, in which a strain of *B. fæcalis alkaligenes* was isolated, the patient's serum agglutinated it in a dilution of 1 in 80. In a number of cases of bacillary dysentery from which a dysentery bacillus was isolated, colonies of the above-mentioned non-lactose fermenters occurred in the plate cultures of the fæces often in greater numbers than the dysentery colonies. The clinical course of the dysentery in these cases was not different from those in which the plate showed an almost pure culture of dysentery bacilli. The post-mortem bacteriological examination of 12 fatal cases of bacillary dysentery showed the heart blood to be sterile in all but one. In this case a *B. coli communis* was isolated from the heart blood and spleen, and a non-lactose fermenter of the Morgan group was isolated from the spleen as well as from the contents of the large gut. The bacteriological findings in the heart blood and spleen were probably due to ante-mortem or post-mortem invasion. There was no evidence obtained that the group of non-lactose fermenters mentioned could produce a dysenteric condition of the bowel or was of importance as possible secondary invaders in bacillary dysentery. Beyond the fact, which was equally characteristic of bacillary dysentery as of simple diarrhœa cases, that the plates often exhibited nearly pure cultures of these micro-organisms, no other positive evidence was obtained (except the one positive agglutination mentioned above) that they were the cause of the simple diarrhœa.

Characters of the Stools.

Character of the stool in severe or moderately severe bacillary dysentery.—A careful study of the macroscopic and microscopic characters of the stool in the various stages of bacillary dysentery has shown that it gives a very definite picture of the pathological changes taking place in the wall of the gut. The primary lesion in bacillary dysentery is in the mucosa of the large intestine. At first there is intense congestion of the mucous membrane with secretion of mucus. The evacuations during this period, which lasts from 12 to 24 hours in severe cases, consist of clear fluid and a transparent mucus flecked or streaked with blood. Microscopically one finds large numbers of red blood corpuscles, white blood corpuscles well preserved, and a few epithelial cells. In the next stage, lasting from the end of the first to the second day, the evacuations consist of bright-red blood, semi-opaque mucus, and clear fluid. Microscopically a large number of red blood corpuscles, pus cells, often occurring in small groups, with a few endothelial and epithelial cells, are found. This corresponds to the stage of polymorphonuclear infiltration with fibrin formation occurring in the mucosa. From the second to the fourth day the evacuations appear as semi-opaque mucus, little blood, and opaque fluid. Bright-red blood is no longer a predominant characteristic and the pus cells have begun to digest the mucus entangling them, with a result that the fluid about becomes opaque, and microscopic examination proves it to consist almost entirely of pus cells. About the fifth day in a severe case little or no blood is to be seen macroscopically and the mucus looks purulent. Microscopically about 90 per cent. of the cells are pus cells, the remaining 10 per cent. consisting of a few red blood cells, lymphocytes, endothelial, epithelial, and plasma cells. At this time coagulation-necrosis, and ulceration of the mucosa are taking place. Quite often at this stage or a little earlier one encounters blood and clear mucus as well in the evacuation, indicating a bacillary dysentery of one day's duration. This always means extension of the disease to a new point. Captain Fletcher has repeatedly verified this finding clinically, the patient complaining of pain at a new point. After the fifth day depending upon the severity of the case, fæcal matter reappears in the stool. If the motions are maintained liquid by saline purgation, tags of greyish opaque mucus may be seen with the naked eye; if formed or soft, no macroscopic evidence of mucus will be seen unless it is emulsified in saline. These tags of mucus consist of degenerated pus cells, endothelial and epithelial cells. In the fæcal portion of the stool pus cells occur singly or in small groups of three or more. If the patient becomes constipated, as patients tend to do at this stage, a hard stool is passed with shreds of yellowish opaque mucus at the side. This has been rubbed off the healing ulcerated surface of the gut, as the hard mass mechanically insults the mucosa in its passage. Such condi-

tion does not aid healing, and should be prevented by appropriate treatment. The passage of sloughs or the predominance of epithelial cells in the mucus described by certain writers has not been found by us. Our microscopical findings agree in every particular with those recently reported by Wenyon and O'Connor—namely, that 90 per cent. of the cells found in bacillary dysentery mucus are pus cells.

During our routine examination of fæces last summer we examined the stools of all cases of malaria passing blood or blood and mucus. Dysentery bacilli were isolated in 62 out of 66 cases of malaria passing stools of the blood and mucus type above mentioned. The remaining four cases were doubtless bacillary dysentery; but a repeated bacteriological examination was not possible at the time. In the past year we have seen two cases of malaria suffering from diarrhœa with considerable blood in the stool. The microscopic examination showed none of the characters of a dysentery, and the bacteriological examination was negative for the dysentery bacilli. The origin of the blood in these two cases was no doubt due to the action of the malarial parasite.

Character of stools in mild bacillary dysentery.—In mild bacillary dysentery macroscopic evidence of blood disappears from the motion in a couple of days, and purulent mucus is never seen. Semi-purulent mucus appears until the fifth day, and at the end of a week a fæcal stool containing tags of mucus is found.

Character of stools in mild recurrent bacillary dysentery.—In mild recurrent bacillary dysentery macroscopic evidence of blood and mucus disappears usually in 24 hours, and is followed by a fæcal stool containing tags of cellular mucus. The presence of small tags of cellular mucus or small groups of pus cells in the fæcal portion of the stool from cases with a history of having passed blood and mucus recently, even for so short a period as 24 hours, has not been found in any other than bacillary dysentery.

Character of the stool in amœbic dysentery.—Owing to the few cases of amœbic dysentery occurring in this area, I hesitate to discuss the character of the stool found in this type of dysentery. In bacillary dysentery we found that the character of the stool indicated the pathological changes occurring in the wall of the gut. Our examinations in a few cases of amœbic dysentery—some being seen post mortem—suggest the importance of remembering the pathological changes that occur in the intestine in this disease. The primary lesion in amœbic dysentery is in the submucous layer of the gut, and consists of a severe hæmorrhagic and later gelatinous infiltration combined with a cellular infiltration which is mainly round-celled, not polymorphonuclear, as in the primary lesion of the mucous coat in bacillary dysentery. The very acute congestion of the mucous membrane found in the bacillary type is absent in the amœbic, hence the absence of the bright-red blood in the stools so characteristic of bacillary dysentery in the early stages of the disease. The infiltration of the submucous coat leads to necrosis of the mucosa. In subacute cases small nodules appear in the mucosa, showing a yellow necrotic centre surrounded by a rather dark congested area. In these cases the motions are fæcal, containing no macroscopic evidence of blood. Mucus, if present, is yellow and quite different from the opaque white mucus, with bright-red blood to be seen in bacillary dysentery during the second and third days of the disease. Microscopically few red blood corpuscles and a non-cellular mucus is found. The only diagnostic feature about it is the finding of pathogenic amœbæ. In certain of these subacute cases there may be no evidence of dysentery during life. This was demonstrated in one of our post-mortems on a man who died from a gunshot wound. One great danger in these cases is the development of amœbic abscess of the liver. This will be discussed further under differential diagnosis. In acute amœbic dysentery the infiltration of the submucous coat is most marked, producing a rather extensive necrosis of the mucous membrane due to a cutting off of the blood-supply. The stools from the acute cases, which nearly always contain fæcal matter, consisted of dark blood, yellow transparent or dirty greyish semi-transparent mucus, with sloughs in the later stages of the disease. Microscopically red blood corpuscles, a non-cellular or very slightly cellular mucus is found, together with pathogenic amœbæ. Sloughs, if present, consist of groups of degenerated epithelial cells, with a few red and white blood corpuscles. Fæcal stools containing dark blood, a yellow transparent or dirty greyish semi-transparent mucus, and especially the appearance of sloughs, have been found characteristic of amœbic dysentery.

Differential Diagnosis of the Stools in Bacillary and Amœbic Dysentery.

Fortunately, in this area less than 3 per cent. of the dysentery is of the amœbic type, so that differential diagnosis is not of much importance. Although the laboratory is the only place in which an accurate differential diagnosis can be made, the early treatment of acute amœbic and bacillary dysentery is too important to await an accurate protozoological and bacteriological examination. The presence of blood and mucus has long been described as a characteristic of the stool in both amœbic and bacillary dysentery, but *the important point is not the presence of the blood and mucus but the appearance of it.* The appearance of the stool in acute bacillary dysentery is so characteristic, especially in the first few days of the disease, that no difficulty in diagnosis should present itself. All cases passing stools containing clear transparent or white mucus flecked or streaked with bright-red blood should be treated as bacillary dysentery. The stools in acute amœbic dysentery are not so characteristic; the appearance of dark-red blood and a yellow or dirty grey semi-transparent mucus in a fæcal stool should suggest amœbic dysentery. It is in this type of case that the emetine therapeutic test serves its purpose for diagnosis in the absence of facilities for laboratory examination. In the post-blood and mucus stage of bacillary dysentery and in subacute amœbic dysentery, the macroscopic appearance of the stool is the same, the previous history of the character of the stools passed being the only aid in diagnosis. As mixed infections of amœbic and bacillary dysentery may occur the laboratory examination is essential. If tags of cellular mucus are found, the patient should be treated for bacillary dysentery; if pathogenic amœbæ together with cellular mucus are found, the patient should receive mixed treatment. All cases of acute bacillary dysentery should be examined for pathogenic amœbæ after blood and mucus have disappeared, especially if the cases are not clearing up as rapidly as they should under proper treatment. It is here that a leucocyte count of 16,000 or over is suggestive of amœbic abscess of the liver; for in bacillary dysentery it rarely exceeds 16,000 even in the blood and mucus stage of the disease.

It is gratifying to note that our findings are in exact agreement with those of such an experienced protozoologist as Colonel C. M. Wenyon. In a recent paper in the *Journal of the Royal Army Medical Corps* for March, 1917, Colonel Wenyon and Captain F. W. O'Connor gave the following conclusions: "The bacillary dysenteric stool when seen at the height of the infection is characteristic both macroscopically and microscopically and can be recognised by its general appearance and by its extraordinary cellular exudate when examined under the microscope. The amœbic dysentery stool contains darker blood and mucus, but cannot be recognised with certainty apart from the amœba. There is absence of the cellular exudate of the bacillary dysentery mucus."

Treatment of Bacillary Dysentery.

Practically all severe and moderately severe cases of bacillary dysentery were treated by Captain A. A. Fletcher. The mild and mild recurrent cases of bacillary dysentery have been treated by Captain R. G. Armour as well as Captain Fletcher. To both these officers and to Captain J. G. Gallie, who had charge of the diarrhœa ward, I am greatly indebted for their coöperation in the laboratory portion of the work and for much of the information relating to treatment.

Previous to July 1st, 1916, we had eight fatal cases of bacillary dysentery. These cases had received the usual treatment of saline purgation, liquid diet, &c., and in addition daily intravenous doses of from 20 to 40 c.cm. of anti-dysenteric serum. Although they had been encouraged to take a large quantity of fluid by the mouth, they became markedly dehydrated and died. At a meeting of this society held last July Captain J. J. McKenzie reported on the autopsy findings in these eight cases. He remarked on the dehydration of the tissues, and stated that the impression he had gained so far, but which he did not wish to state too dogmatically, was that the primary cause of the death had not been a primary cardiac failure, but that it was due to failure of

the circulation on the vaso-motor side; in fact, to the condition which had been spoken of as toxæmic shock. About this time a paper, published by Mellanby, entitled "An Experimental Investigation on Diarrhœa and Vomiting in Children," appeared, which seemed to have a very direct bearing on the treatment of severe bacillary dysentery. He showed (1) that if the body fluids are below normal the absorption of toxins from the intestine goes on at a maximum rate, and the absorbed toxic substances have their full toxic action, and cannot be made harmless by the tissues of the body. (2) Water in the intestine delays the absorption of toxic substances. (3) Magnesium sulphate of a concentration of 2 per cent. or over delays the absorption of toxic substances from the intestines. Treatment was therefore inaugurated with the idea of maintaining the body fluid normal, or above normal if possible, by the injection of normal saline intravenously or subcutaneously. This would also tend to increase the cathartic action of the saline purgative and maintain the contents of the intestine more liquid. The rest of the treatment remains practically the same as that given the fatal cases. The results of this method of treatment have been most encouraging when one considers that treatment was begun in nearly all cases after the third day of the first appearance of blood and mucus in the stools. We have had three fatal cases of bacillary dysentery since July 1st, 1916, and one of these died six hours after entrance to hospital, and cannot be considered as having undergone treatment. The other two fatal cases came under treatment for over two weeks. Why these two cases did not react to treatment we are unable to explain. Later, a similar case recovered after five weeks of treatment. Considering only those cases having over 20 blood and mucus stools per day and from which a dysentery bacillus had been isolated, the death-rate has been 2 in approximately 200, or about 1 per cent. If all cases of bacillary dysentery diagnosed bacteriologically are considered, the death-rate has been below 1/3rd per cent.

Serum therapy.—The curative action of antidysenteric serum is due primarily to its antitoxic and secondarily to its antibacterial properties. Since the symptoms in bacillary dysentery are due to the absorption of the toxin of the dysentery bacillus, specific therapeutic measures should be directed to the neutralisation of the toxin in the most rapid and effective way possible—i.e., by the intravenous injection of dysentery antitoxin. Owing to the low antitoxic content of antidysenteric serum, the amount of serum injected should be greater than in diseases like diphtheria and tetanus. Where it is impossible to give intravenous injections, serum should be given intramuscularly, as absorption is much more rapid than from subcutaneous injections.

Dangers of serum therapy.—Severe reactions, occasionally with a fatal issue, have followed injections of serum. They are more common in asthmatics and in people who have previously been treated by serum, and are more severe following intravenous injections. Asthmatics should receive an injection of atropine before the administration of the serum. The dangers of severe reaction following intravenous injections of serum may be avoided by the Besredka method of administration—i.e., ½ c.cm. of serum intravenously followed in two minutes by 2 c.cm., and in five minutes by 5 c.cm., and the balance of the serum in ten minutes. Although this method is uniformly satisfactory, it demands time. Our own experience in over 500 cases has been that severe primary reactions may be avoided by the preliminary administration of 2 c.c. of serum, and the slow administration of the balance in ten minutes. Mild reactions occurred in a few cases receiving serum by this method. We have had one severe primary reaction following the injection of the whole dose of serum at once, and one other case had a severe late reaction occurring the fifth day after the last injection of the serum. This was associated with a marked fall of blood pressure, the patient reacting after the use of stimulants. Urticaria, joint pains, and pyrexia followed as late reaction in the majority of the cases treated.

Results of serum treatment.[3]—It is impossible in this paper to discuss the question of serum treatment in detail, and the following remarks are simply some of the conclusions drawn from our experience. In the first place it must be remembered that practically all cases were treated after the third day of blood and mucus. Many of the cases had received 20 c.cm. of serum subcutaneously before entering the hospital. There was no evidence that this had been of value. Cases in hospital received from 20 to 80 c.cm. of serum once or twice daily, continued in some for as long as nine days. The best results have been obtained from the intravenous injection of from 60 to 80 c.cm. of serum, followed by from 150 to 300 c.cm. of normal saline twice daily for the first two days and once daily for the next two. In very toxic cases 5 per cent. glucose in distilled water should be substituted for the saline. Shiga infections reacted better than Flexner-Y infections, especially when the serum was given during the first three days of the disease. The most striking effect produced by the serum was the relief of abdominal pain and tenesmus; a marked reduction in the number of stools was noted in the majority of cases, but there were exceptions. It is impossible to make a definite statement of the effect of serum treatment in convalescence. This can be obtained only by a careful study of the complete record of cases treated with and without serum. Our own opinion is that it had a favourable effect. Our mortality was much higher in cases in which serum was given alone, and dehydration of the tissues not prevented by the giving of normal saline intravenously and subcutaneously.

In the treatment of chronic, mild, and mild recurrent dysentery, dehydration, toxæmia, and collapse are not disturbing factors, and the use of normal saline is not indicated and serum does not appear to do any particular good. The use of a vaccine is the more rational form of specific therapy and preparations are now being made for testing them in treatment. In mild cases blood and mucus rapidly disappear, so that treatment must be directed, as in severe bacillary dysentery after the reappearance of fæcal stools, to the healing of the ulcerated mucosa by the judicious use of saline purgatives and careful dietetic treatment.

Drug treatment.—All patients received on admission ½ oz. of castor oil followed after eight hours in the blood and mucus stages by 2 drachms of sodium or magnesium sulphate. This was repeated every four hours during the day as long as the mucus stage lasted. After the disappearance of mucus a sufficient quantity was given to produce a soft motion with the idea of injuring as little as possible the healing ulcers in the intestines by the passage of fæces. There was no indication for the use of opium in any form as the pain and tenesmus were relieved by the serum. Intestinal lavage with solutions of eusol, potassium permanganate, protargol, or normal saline was given morning and evening if the patient received relief therefrom. The use of enemata containing opium is not a rational method of therapy in bacillary dysentery and should be discouraged. Intestinal astringents or intestinal antiseptics by the mouth were not used, as they do not tend to improve the digestion or assimilation of the food in the stomach and small intestine. These drugs, if given at all, should be given as enemata.

Dietetic treatment.—Dietetic treatment is the most important factor in the cure of a patient suffering from bacillary dysentery. Our serological examinations have shown that second attacks of bacillary dysentery are very seldom new infections, but relapses from previous ones which have not been cured either from the absence or lack of efficient treatment. Sensitive as the intestinal mucosa in bacillary dysentery is to sudden changes of diet, it is not surprising when relapses occur in patients shortly after leaving hospital, the ordinary diet of beef, vegetables, and bread changing to one of bully beef and biscuits plus exercise. Changes in diet must be gradual and the test of cure in a patient before returning to duty should be—"Can he, while undergoing moderate exercise, withstand the ration he will receive on leaving hospital without having intestinal discomfort?"

In the treatment of the acute phase of the disease dehydration of the tissues must be prevented, the food must contain sufficient calories for the increased metabolism, and be easily digested and assimilated. The amount of fluid taken by mouth is not sufficient to keep the body fluids normal or above normal, so that the administration of 300 c.cm. of normal saline intravenously and a half litre subcutaneously is necessary for the first few days in severe bacillary dysentery. In very toxic cases the substitution of 5 per cent. glucose in distilled water for normal

[3] The antidysenteric serum used was obtained from the Lister Institute.

saline has the greater value. This not only provides the required amount of fluid, but also stimulates the heart and supplies an extra number of calories in the food. During the first three days milk should not be given in any form. Suitable diet in the beginning consists of albumen water, gruels, and clear tea sweetened with lactose. Lactose is of great value not only for its supply of food calories, but also for its favourable action on the bacterial flora of the intestine. This diet should be gradually changed to one of arrowroot, Benger's food, malted milk, sour milk, or diluted ordinary milk, lactose diluted in some fluid being continued. It is very important to keep the mouth clean by washes and the chewing of some solid substance while the patient is on liquid diet. When mucus has disappeared soft poached eggs and a couple of biscuits may be given, the inclusion in the dietary of custards, pudding, and dry toast being made gradually. Later a solid diet of chicken, stews, mashed potatoes, peas, and beans may be tried, followed by beef, vegetables, and bread. Untoasted bread is a very disturbing factor and should not be given until the patient is accustomed to a solid diet. Where patients remain long enough in hospital dietetic treatment should be completed by giving them the Army ration of bully beef and biscuits, besides putting them on moderate exercise.

A competent nurse is a great asset to a dysentery ward. Careful nursing is most essential for the early treatment of dysentery cases. Without her coöperation the administration of fixed dietetic measures is impossible in a ward, where Tommy on solid diet will innocently share his last crust of bread with his less fortunate neighbour on liquids, these dietetic indiscretions being usually the undiscovered cause of the medical officer's disappointment in the progress of his cases.

General Conclusions.

1. Ninety-five per cent. of the dysentery occurring in the British Salonika Force is of the bacillary type.

2. Stools in the blood and mucus stage of bacillary dysentery are sufficiently characteristic to diagnose the case "clinical bacillary dysentery" and treat it as such.

3. In fæcal stools the presence of cellular mucus in which pus cells predominate or of small groups of pus cells is sufficient to warrant the diagnosis of "clinical bacillary dysentery."

4. A mild form of bacillary dysentery which in this paper has been called "mild recurrent bacillary dysentery" is the cause of the diarrhœa in a very fair percentage of the cases admitted to hospital as simple diarrhœa.

5. There is no evidence that the intestinal flagellates produce a dysentery, and that they are causal agents in simple diarrhœa more proof is necessary.

6. The prevention of dehydration of the tissues by the injection of normal saline is of primary importance in the treatment of severe bacillary dysentery.

7. Intravenous injection of antidysenteric serum in doses of 60 to 80 c.cm. once or twice daily the first three days of treatment gives the best results.

WESTMINSTER HOSPITAL APPEAL.—A special committee, of which Sir J. Wolf Barry, K.C.B., is chairman, has issued an appeal for £20,000 on behalf of Westminster Hospital, and the Prince of Wales, as President of the hospital, has contributed £1000 towards the required amount. The unsatisfactory position of the hospital finances, in spite of the utmost care and economy, is in the main due to war conditions, among them being the treatment of wounded sailors and soldiers, the War Office payment for the 100 beds set apart for this purpose falling far short of the actual expenditure.

THE MENTAL AFTER-CARE ASSOCIATION.—This is the only charity of the kind in the United Kingdom, and the committee make an earnest appeal for further funds to carry on and extend the work of assisting poor persons convalescent or recovered from institutions for the insane. Applications for aid during the past two years have increased by about 60 per cent., many of the unfortunate subjects being almost destitute and unable to get the fresh start in life necessary to become self-supporting. The association is well deserving of the support for which it asks, and subscriptions should be sent to the Secretary, Church House, Westminster, S.W., or to the bankers, the Union of London and Smiths Bank, Limited, Victoria-street Branch, Westminster, London, S.W.

WOUNDS OF THE CHEST AS SEEN AT AN ADVANCED OPERATING CENTRE.

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THE following notes on chest injuries have been compiled from observations made at an Advanced Operating Centre. The cases were seen early, generally within a few hours of the patient being wounded. The centre was intended primarily for wounds of the abdomen, and only the severer cases of chest injuries were received. In a large number of the patients admitted both abdomen and chest were involved, but these have been omitted from this series, as they have been dealt with in a previous paper by us.[1]

Some 500 cases of chest injury have passed through our hands. Of these we have full notes of 140 consecutive cases treated during a comparatively quiet period of six months, and the figures and analyses in this paper are based on this latter series.

Classification.—Chest wounds may be classified into two main groups—"leaking" and "closed"—the two groups depending ultimately on the size of the wound. A leaking wound causes a "leaking pneumohæmothorax," whereas a closed wound may produce either a simple hæmothorax or a closed pneumohæmothorax. In addition to these main groups there is a miscellaneous number of cases in which the missile, penetrating the chest, causes other complications such as bronchitis, broncho-pneumonia, collapse, &c., with or without a hæmothorax. These will be considered towards the end of this article.

Definition of the terms "closed" and "open."—In all cases at the moment of wounding there must be a communication between the pleural cavity and the exterior. If, however, the wound is only small or is valvular, the track closes sufficiently to prevent the air passing in and out of the pleural cavity with the movements of respiration; this is called a "closed" lesion. If, on the other hand, air or bubbles escape from the wound on respiration when the patient is examined or when he coughs or is rolled over, we are dealing with a "leaking" wound. Blood escapes from any recent wound of the chest, but if it is excessive and dark in colour, it means that the communication with the pleural cavity is patent and air will be detected as well.

The earlier the patients are seen after wounding the larger will be the proportion of leaking to closed cases, since many of the former tend to close spontaneously during the first 24 hours.

Primary hæmorrhage into pleural cavity.—Before discussing each class separately, there is one complication which is common to both and which ought to be considered—viz., primary hæmorrhage into the pleural cavity. The hæmorrhage is internal in a closed, and both internal and external in a leaking lesion.

Primary hæmorrhage is the chief cause of death during the first few hours after the receipt of a wound of the chest. When severe, the patients are brought in blanched, restless, and with a rapid pulse. The restlessness is the most marked feature of the case, and in the worst cases morphia may fail to control it, because it is not absorbed on account of the failure of the circulation. We had 12 fatal cases; 9 of these were pulseless on admission, and of the remainder the pulses recorded were 132, 136, and 140 beats per minute respectively. In addition to these there were 7 fatal cases in which the primary hæmorrhage was complicated by other injuries to spine or limbs. The 12 uncomplicated fatal cases survived their wounds on an average 24 hours. After death an examination was made to try to find the source of the hæmorrhage in one or two cases, but it was unsuccessful.

The treatment for these bad cases is mainly expectant, and our chief aim is to keep them as quiet as possible and to ease their pain by the use of morphia or heroin. They require very careful handling, rolling them over on to their sound side to dress the wound being sometimes sufficient to cause death. For this reason, in some cases it may be

[1] THE LANCET, April 28th, 1917.

advisable to leave the patient 24 hours or more with the wound unattended to. Even patients who have a readily perceptible pulse may die suddenly if rolled on to their sound side in the first 12 hours after being wounded. The bleeding does not usually continue after 24 hours, and we have had at least two cases of recovery in patients who arrived blanched and pulseless. In only one patient was it noted that, arriving in fair condition, he died within 48 hours from the internal hæmorrhage continuing. In this case the continuance of the bleeding was associated with adhesions which prevented the lung from collapsing.

The blood usually comes from the deeper blood-vessels in the lung, and Nature's method of arresting it is to cause collapse of the lung. The pressure on the lung exerted by the accumulation of fluid in the pleural cavity will not, by itself, assist much in the arrest of hæmorrhage, for the patient will bleed to death into the pleural cavity before the intrapleural pressure is sufficiently raised to produce this effect. We have not seen a single case in which severe hæmorrhage came from an intercostal artery, and therefore plugging of the wound is of no real benefit, and, moreover, it prevents the entrance of air into the pleural cavity, which is the most rapid way of causing collapse of the lung. In a large wound, where complete collapse of the lung is almost instantaneous, a plug may be beneficially employed in the early stage; not for the purpose of arresting hæmorrhage, but to assist the embarrassed respiration of the unwounded lung by preventing the air entering the chest more freely through the wound than through the normal air-passages. Patients are not usually transfused as the bleeding may be still continuing. They are given frequent small cold drinks and calcium lactate gr. 5 every two hours.

While on the subject of bleeding, the question of hæmoptysis deserves mention. It was found to be present in 65 cases out of 100 undoubted penetrations of the chest in which its presence or absence was noted, but in none of our cases was it severe enough to cause any anxiety. In most cases it only continued for a day or two, and in only one patient was it still noted on the tenth day. Hæmoptysis points to bruising or laceration of the lung, but it may be absent in cases where the lung has been traversed by a missile from end to end.

In our series there were 44 cases of leaking pneumohæmothorax and 72 cases of hæmothorax or closed pneumohæmothorax.

A. *Leaking Pneumohæmothorax.*

44 cases, with 27 deaths, giving a mortality of 61 per cent.

The most interesting points for discussion with regard to these cases are: (1) How many become infected, and (2) the treatment which experience recommends for the condition.

1. In ascertaining the number which become septic we must exclude all those cases which die before the pleura has had time to become grossly infected—i.e., within 48 hours of being wounded. Of these latter we had 18 fatal cases who died from primary hæmorrhage, shock, or complicating wounds. We had 26 patients who lived long enough for infection to occur, and of these 15 became septic, of whom 9 died. The proportion of leaking pneumohæmothorax cases which became infected is therefore 57 per cent., which we shall see later is fives times as high as in cases of simple hæmothorax. The question of sepsis, therefore, is a very important one, and is directly dependent on the size of the opening into the pleura. In the 11 cases which recovered without becoming infected, the leakage of air soon ceased of itself or was stopped by operation, and the escape of blood was reduced to a mere staining of the dressing within 48 hours. Any wound which leaks air, or blood and pleural fluid freely after 48 hours will become septic. This question of sepsis is important, not only on account of the number of deaths it causes, but also from the prolonged convalescence and invalidism resulting in those who recover after drainage of the pleura. In a few of the cases a record was kept with regard to the nature of the missile associated with infection with the following results:—Bullet wounds—remained aseptic 4; became infected 4. Shell wounds—remained aseptic 5; became infected 11.

The patients who died from sepsis succumbed from the fourth day onwards in spite of operations for drainage of the pleura. Several cases of interest occurred in the series.

One man, in addition to a large wound over the chest had a wound in the lumbar region on the same side and developed localised tetanic spasms in the arm and leg and lumbar muscles on the same side as the injury. This commenced on the sixth day in spite of the usual prophylactic dose of serum. He never had any rigidity of the jaw muscles, but died on the fourteenth day from septic absorption.

A second patient had an arterio-venous aneurysm of the third part of the subclavian artery, which was caused by the bullet as it entered the chest. He had a very marked thrill to be felt all over the front of the chest, with a loud humming murmur on auscultation and pain down his arm.

A third man was wounded in the first left intercostal space by a shell fragment which passed downwards and inwards, behind the manubrium. The wound discharged a little brown sanious fluid and air bubbles. He had a rigor on the third and fourth days, and death occurred on the fifth day after two severe hæmorrhages. It was found that a piece of shell with clothing round it was lodged in the upper part of the pericardium. An edge of the fragment was embedded in the wall of the ascending aorta, making an opening half an inch long. No leaking of blood took place from the aorta till ulceration of the vessel wall commenced. Fibrinous pericarditis was present.

2. *Treatment of leaking cases.*—There are four methods of treatment which suggest themselves for dealing with these cases.

(*a*) *Simple dressing.*—The wound is swabbed over with an alcoholic solution of picric acid or iodine, and dry gauze applied. After 24 or 48 hours if the wound is small, the leakage of air will cease, and the escape of blood will be reduced to a mere staining of the dressing. It is important to use a dry dressing and to get the wound to dry up as soon as possible. A little experience will show in which cases this treatment is likely to be sufficient. If the discharge continues free for more than 48 hours, or if, after having ceased for a few days, it begins to come away freely again, so that the wound requires packing and repacking, sepsis is almost certainly present, and resection and drainage may be performed without waiting for the bacteriologist's report.

(*b*) *Plugging the wound.*—This has been done with two objects—to arrest hæmorrhage and also to hinder the entrance of germ-laden air. It has been shown earlier in this article how useless the gauze plug is for arresting hæmorrhage, and that it is only recommended as a temporary measure where there is so free an opening that respiration is seriously embarrassed. It is very difficult to render a large wound airtight with gauze, and a small wound will usually close of itself. There is also always the great danger of introducing germs from the edge of the wound. After being plugged the track of the wound acquires a white sodden surface in which organisms readily flourish. In most cases, therefore, we do not advocate this method of treatment. The pleura can often deal with the germs carried in with the missile, but the mixed infection caused by germs which enter with the air or grow in along the track will inevitably lead to trouble.

(*c*) *Sewing up the wound, with or without the removal of the foreign body.*[2]—The removal of the foreign body from the lung is only justifiable in a few selected cases, but the sewing up of the wound is advisable in all cases of leaking chest wounds, since it is by this means we can prevent the pleural cavity from becoming infected in more than half the cases. Actual figures give: uninfected, 18; infected, 11; and doubtful, 2. Before this treatment was adopted all wounds which leaked for 48 hours became infected. The following points should be considered.

Time for operation.—It is best to wait till the shock has passed off, but about 12 hours from being wounded is perhaps the time for choice. Every hour that the leak continues increases the risk of pleural infection. In 2 severe cases where shock was prolonged even operation at 36 hours prevented sepsis recurring. Primary hæmorrhage should have ceased before the operation is undertaken.

Size of the wound.—A small hole will close of itself, and experience soon teaches us which will close and which will remain open.

Bullet wounds.—Sometimes an explosive type of wound is caused by a bullet striking a rib, either at its entrance or exit from the chest. These cases are very suitable for operation.

Position of the wound.—If the wound is high up towards the apex of the lung, sewing up is especially indicated as this position is very bad for drainage of the pleural cavity. The weight of a patient, as he lies in bed on his back, will help to keep some wounds closed over the lower part of the chest posteriorly, so that suture of these wounds may be sometimes postponed for a little if it be necessary.

Anæsthetic.—In our experience chloroform and warmed oxygen is the most suitable anæsthetic, a preliminary dose of morphia and atropine having been given. The patient should be in a very light state of anæsthesia, just "grunting."

[2] We first tried closing "leaking" chest wounds in November, 1916, and ten months' experience of the operation has confirmed us in recommending it.

A contour wound of the chest wall, where the pleural cavity is laid open without the missile being retained inside, is also very suitable for operation.

The operation of sewing up only takes a few minutes. A complete excision of the wound, down to and including the pleura, is made; any jagged ends of fractured ribs are trimmed off and any loose pieces of bone removed. We do not attempt in most cases to sew up the pleura by itself, but the muscular tissue and pleura are drawn over the opening with catgut, the last suture being tied at the end of an act of expiration; the skin is sewn up with silkworm-gut sutures passed deeply through the tissues. No harm is done by this little operation. If the pleural contents do become infected the wound will become moist in 48 hours and discharge; the stitches are in this latter case removed and a tube inserted for drainage. Infection of the subcutaneous tissues is often encouraged by tension and may be relieved by cutting the skin sutures only.

Removal of the foreign body from the lung itself is a serious operation which should not be at the present time undertaken as a routine, but should be reserved for wounds leaking badly and when the foreign body, located by the X rays, is larger than a "filbert." Bits of bone driven in are, perhaps, more liable to give rise to trouble than is metal. Further experience will teach us the chief indications for this operation which, when successful, is the most satisfactory form of treatment.

In wounds of the lower part of the chest, wounds of the diaphragm must not be overlooked, and if found accessible must be sewn up before the chest wall is closed.

A word of warning is, perhaps, necessary in discussing operations on the chest. There is a great temptation to try to do more than is justifiable for these cases. They will not stand a long operation, and it is often necessary to allow minor injuries to go unattended in order to make certain of the main object of this procedure—namely, the closing of the pleura from contamination from the external air or from the surface of the skin. Extensive resections of ribs or even very extensive skin incisions are not justified unless the patient is in exceptional good condition. No object is gained by spending time in sewing up holes in the lung or tears of its surface.

B. *Hæmothorax and Closed Pneumohæmothorax.*

The treatment of the cases of closed pneumohæmothorax differs in no way from that of an ordinary hæmothorax, although there is a greater danger of raised intrathoracic pressure and excessive cardiac displacement. The air comes from the injured lung. Blood, when extravasated into the pleura, causes irritation and the outpouring of a certain amount of pleural effusion.

Some amount of hæmothorax must be present in every penetrating wound of the chest, but in this series only those are included in which there was enough blood extravasated into the pleura to give rise to physical signs and to be proved by an exploring syringe.

We had 72 cases of hæmothorax and closed pneumohæmothorax with 14 deaths, giving a mortality rate of 19·3 per cent. Of the fatal cases, 5 died from primary internal hæmorrhage. Of the 67 cases that survived 48 hours, 8 became infected (11·9 per cent.) while under our care, and 5 died from this cause—a mortality rate of 7 per cent. The average stay of our hæmothorax cases at the Advanced Centre was seven days.

The three patients who recovered after rib resection and drainage had shown signs of infection on the fifth, tenth, and thirteenth days respectively. The last two were examples of late anaerobic infection, in which the germs are surrounded by blood clot, and no gas is found till the organisms become dislodged from aspiration or any other cause. There are one or two signs that act as danger signals indicating that the hæmothorax is becoming infected. (*a*) The pulse-rate remains rapid. (*b*) The temperature does not begin to fall as it should do after three or four days in an uninfected hæmothorax. (*c*) The patient complains of pain and tenderness on percussion over the affected part of the chest, signifying an inflamed pleura or raised intrathoracic pressure at this spot.

The five fatal cases of infected hæmothorax were:—

The first patient was wounded by the casing of a bullet. He had no leakage from his wound on admission, but it commenced to discharge freely dark fluid blood on the seventh day—a sure sign of septic infection. He was drained, and after death it was found that the pleural cavity was loculated, being divided up by adhesions into large cavities, only one of which was being drained. The pleura was found to be covered by a layer of lymph nearly one inch thick.

The second patient was an example of the rapid infection of the pleura which sometimes occurs. He was admitted with a perforating bullet wound towards the periphery of the chest, a case that one would regard as of the most hopeful kind. Within 48 hours of being wounded he became delirious, and from the wound, which had been nearly dry, a large amount of dark fluid escaped. The chest was immediately opened up, washed out with eusol, and drained, but he died three days later with increasing signs of septic absorption.

The third patient showed signs of infection on the day after he was wounded, with rapid pulse, profuse sweating, delirium, and, finally, unconsciousness, and died on the fourth day. A few hours after death the subcutaneous tissues were found to be distended and all the solid organs of the body honeycombed with bubbles of an inflammable gas. The left lung was partially collapsed, but only a few ounces of dark fluid were found in the pleural cavity. There was, however, a thick layer of fibrin deposited on the pleura.

The fourth case sustained a severe glancing wound of the chest wall without actual penetration. He died ten days later from sepsis. It was found that he had several loculated cavities in the left pleura containing fluid blood and clot, and also extensive hæmorrhage in the left upper lobe of the lung and in the interlobar fissure.

The fifth case left us apparently convalescent, but died at the base.

Of the fatal cases of hæmothorax which did not die of sepsis, broncho-pneumonia caused the fatal result in one case, and heart failure in the other two. Both the latter cases were admitted in good condition, but on the third day the pulse-rate increased by about 40 beats per minute. Aspiration was performed, but afforded no alleviation of the symptoms; the expectoration completely ceased, though mucus accumulated in the tubes and death ensued. Examination after death proved the absence of sepsis and showed death to be due to heart failure rather than to the state of lungs or pleura.

In these cases of hæmothorax a record was also kept in regard to the missile, giving the following figures:—

Shell fragments (including bombs, rifle grenades, &c.) caused 36 cases, of which 4 became infected.
Bullets caused 12 cases, of which 2 became infected.
Bullet casing was found in 1 infected case.
Shrapnel balls caused 8 cases, and not one became infected.

Shrapnel balls, on account of their roundness and smooth surface, are not so liable to carry fragments of clothing into the wound.

Treatment of hæmothorax.—It is most essential to examine all chest cases every day, especial attention being paid to the position of the cardiac apex-beat. It often happens, if surgical emphysema is present, that the superficial cardiac dullness cannot be made out and the apex beat may not be palpable. The position of the heart must then be made out by auscultation and by determining where the heart's sounds are heard the loudest. Every case of hæmothorax should be explored with a small needle once or twice while under observation and the condition of the fluid noted.

One case in five of our cases had aspiration performed before evacuation. After the second day it should be done whenever there is effusion enough to cause cardiac displacement of an inch or more. The tendency was, as one's experience increased, to perform it on more and more cases and at an earlier and earlier date. All the fluid that will run off easily is removed, but it should be drawn off very slowly; thus an hour may be taken to draw off three pints, which gives a rate of one ounce per minute. The largest amount we have drawn off at once was 74 ounces, which was taken from a patient wounded four days previously. In none of our cases did aspiration cause a recurrence of hæmorrhage into the pleura.

Practically every case of closed pneumohæmothorax requires early aspiration. Those cases in which there was a considerable amount of air in the pleura occurred in the proportion of one to ten simple hæmothorax cases. A specimen of the fluid drawn off should invariably be sent to the laboratory for a report, but if it has any offensive smell resection and drainage should be performed without waiting for the report.

Miscellaneous Complications.

Collapse.—The usual effect of a penetrating wound is collapse of the wounded lung of greater or less extent, and occasionally the same occurs in the unwounded lung. Collapse of the wounded lung is most marked in cases of pneumohæmothorax or very large effusions, and the lung is then often contracted down to the size of two fists, and the

condition is explainable by the raised intrathoracic pressure. Collapse, as it has been insisted on earlier in the article, is far and away the most potent method Nature has of arresting pulmonary hæmorrhage, and where it does not or cannot occur the patient will bleed to death from a relatively small pulmonary vessel being cut across. But massive collapse will occur on the wounded side when there is very little hæmothorax and no raised intrathoracic pressure, and it also is fairly common on the unwounded side. There are two factors which may assist in the process:—

1. Cessation of movements of the diaphragm on the wounded side. This leads to absorption of air from the pulmonary alveoli, and no more entering to replace the absorbed air the lung collapses.

2. Blood-clot completely blocking a main bronchus. This may occur on the wounded or unwounded side and causes the same sequence of events. The clot also may have a valvular action, allowing the air to escape with expiration, but preventing fresh air entering to take its place.

The following case gives a fairly typical picture of the signs and symptoms of the condition.

A man was admitted with a wound in the first right intercostal space two inches from the sternum and the missile, which was a shell fragment, was removed from over the centre of the spine of the scapula on the same side. His general condition was good and pulse only 84. On the third day he had these physical signs: Heart displaced to left, with apex beat at level of fourth rib, two inches outside nipple line. Impaired resonance and tubular breath sounds, anteriorly over upper lobe of left lung, posteriorly over left lung, with crepitations at left base. Breath sounds increased everywhere over right lung. The stomach note reached to the level of the nipple in the axilla.

The diagnosis is made on the position of the apex beat, which is pulled over to the side of the collapsed lung since there is nothing on the wounded side to push it over. The diaphragm is raised as is shown by the apex beat being on the level of the fourth rib and the stomach note being made out at a high level in the axilla. Supplementary signs are the increased area over which the cardiac pulsation can be felt and also the immobility of the left side of the chest. The reduction of the total functioning lung tissue increases the number of respirations, and this is particularly noticeable on any movement of the patient, so that he readily becomes cyanosed on exertion. The patient whose case is described above had a pulse-rate of only 84, but often had a respiratory rate of 48 or over. Tubular breath sounds and impaired resonance over the lower lobe of the unwounded lung commonly occur on the second or third day and point to collapse or congestion. The presence of many rhonchi and râles indicate congestion and call for energetic stimulation.

Bronchitis and bronchopneumonia.—These occur in both the wounded and unwounded lungs, more especially in cold weather, and they are serious complications. Two deaths occurred in our series from them. The physical signs were high fever, many râles and rhonchi over both lungs, with patches of tubular breath sounds, and the expectoration of a purulent or muco-purulent sputum. Some of the patients gave a history of bronchial catarrh previous to being wounded, but in others the condition is directly attributable to the wound. We had no case of lobar pneumonia.

Pleurisy is very common and requires no especial notice except to remark that a transient rise of temperature is sometimes associated with it. Surgical emphysema, when extensive, is often associated with the severe types of chest wound, and if it spreads to the mediastinum it may directly lead to a fatal result. We had one such case in which no other cause of death could be found.

Secondary hæmorrhage from the lung.—This is another way in which infection may prove fatal—it is very rare in chest wounds compared with other wounds. One such case occurred.

It was in a man who had been wounded in the right upper arm by a bullet which passed directly inwards across the front of the chest, making a large exit wound below the right sterno-clavicular joint, without actually penetrating the chest. The wound became infected in spite of being cleaned up under an anæsthetic. He died on the eighth day after two very severe hæmorrhages from the inner end of the wound for which plugging was tried without avail. It was found that the upper part of the lung was adherent to the chest wall and on its anterior margin was an area the size of a Tangerine orange into which hæmorrhage had occurred. The bullet had not penetrated the pleural cavity, but the lung had been bruised, become infected and had broken down, forming a cavity. In the wall of this cavity a vessel had ulcerated and been the source of the bleeding. There was a minute tear of the parietal pleura which had allowed the blood to escape externally.

Cardiac complications.—We have had no case of wound of the heart to treat, but several patients have had the track of the missile in close proximity to the heart; two of these developed a transient pericardial friction comparable to the transient pleural friction so frequently heard. Patients wounded in the chest occasionally die of simple heart failure on the second or third day, which may be associated with congestion of the unwounded lung.

We should like to call attention to loud "tapping" sounds which we have heard over the cardiac area in nine cases of wounds penetrating the left chest, where the missile had lodged near the heart, or where the track of the missile had passed in its close proximity. These sounds were quite distinctive and similar in each case, only varying in intensity. They were most marked when the patient was first examined after wounding and persisted for a variable time, occasionally for only 24 hours, but in one patient they were still present on evacuation a fortnight later. The sound continued even when the breath was held, although the intensity varied with respiration, increasing during inspiration and diminishing during expiration in all cases. It was synchronous with the heart beats, and when loud rendered the heart sounds inaudible. In four patients the sound could be heard with the ear held some inches away from the chest, and the patients were even conscious of it. The sound had no resemblance to pericardial friction, and in the cases referred to there was no suspicion of any gas being present in the pericardium, which has been described as giving rise to very extraordinary noises.

In one case examined by us under the X rays the missile could be seen at the end of the upward movement due to inspiration to give a distinct side-to-side oscillation due to the cardiac contraction, and this corresponded in point of time to the maximum intensity of the sound, although in this particular case there was a distinct area of normal lung transillumination an inch and a half wide between the shadow due to the heart and that of the foreign body.

It is difficult to account for the origin of the sound, since it is associated with so many differing conditions. The foreign body may not even be in the chest at all, or it may be embedded in the substance of the heart itself. One possible explanation is that a small column of air, confined in a bronchus either by the missile or by blood clot, is set in vibration by the cardiac contractions and produces the sound. The following two cases exemplify the condition, and attached to each is the X ray report as received from the base.

Private D. was admitted seven hours after being wounded by a shell fragment in the left chest; wound of entry in the eighth interspace in mid-scapular line. He had the tapping sounds in a wide area radiating from the position of the apex beat. These sounds had gone when examined on the second day, but a pericardial friction rub was then present. The physical signs on the second day were as follows: Heart's apex beat in fourth interspace in nipple line. Dullness over left upper and lower lobe, with tubular breath sounds over the upper lobe. Right lung normal. He developed some collapse of the left lung, as shown by the position of the apex beat and by the stomach note reaching the level of the nipple in the mid-axillary line. He was decidedly dyspnœic from the first, especially on movement. A report from the base one month after being wounded stated: "X ray shows the missile lying on a level with the under surface of the head of the eighth left rib (depth not localised). There is also an opacity of the left chest, with retraction of the heart to the same side. No tapping sounds or pericardial rub to be heard. Temperature has been normal while here; there is still dullness over the three upper interspaces in front. Diagnosis: Collapse of left lung, possibly some fluid at the base."

Private E. was admitted eight hours after being wounded in the left chest; wound of entry in ninth interspace in mid-scapular line, involving tenth rib. He complained of pain in the pericardium and was rather dyspnœic. The physical signs on second day were as follows: Heart's apex beat in normal position. Tubular breath sounds external to inferior angle of left scapula. Surgical emphysema present over large area on left side, in front below third rib, and behind below scapula. Diminished breath sounds locally in second and fourth left interspaces in anterior axillary line. Tapping

sounds heard best to left of sternum in fourth interspace. A week later exploration in the left axilla showed normal hæmothorax fluid. A report from the base four weeks after being wounded stated: "Treatment expectant. The X ray shows shrapnel ball in left lung which moves laterally with the pulsations of the heart."

In publishing these observations we feel we must again thank Surgeon-General Bruce Skinner for the help he has given the Advanced Operating Centre, and we should also like to thank Colonel Sir Wilmot Herringham for his advice and assistance. We are conscious of the lack of many scientific details in our notes, but it must be borne in mind that the work has been carried on at the front and under active service conditions. We have purposely omitted the discussion in detail of the removal of foreign bodies from the chest, as we consider this operation is still *sub judice*.

Medical Societies.

HUNTERIAN SOCIETY OF LONDON.

Hunterian Lecture on War-time Orthopædic Surgery.[1]

AT a meeting of this society on Jan. 2nd the Hunterian Lecture on War-time Orthopædic Surgery was delivered by Sir ROBERT JONES, C.B., who introduced the subject by insisting that the wider application of the term orthopædic surgery made the aim of the orthopædic surgeon preventive and educational as well as curative. The orthopædic mind, he said, thought in terms of function and had to deal with a pre-operative and post-operative stage as well as an operative stage, which, although it may be essential, has only a proportional value. He defined the conditions roughly, which, taken together, create an orthopædic case under the following heads: 1. The mechanical injury to bone, joint, muscle, or nerve. 2. The atrophy and disease of these structures primarily due to the injury. 3. Incoördination of movement due to disease of the brain—a result of atrophy and disease of peripheral structures. 4. Psychological conditions which can be overcome by re-educational processes.

Speaking of the *number of orthopædic cases* and their hospital accommodation, and the necessity for *orthopædic centres*, he said that about 50 per cent. of the wounded of this war have received injuries resulting in impairment of locomotor function, the number of wounded men being so great as to form an economic problem for the present and future. The present problem is how most rapidly to make the wounded man fit for military service; or failing fitness for military service, how to make him an independent self-supporting citizen. The future problem is how the partially disabled man is to be kept as fit as possible after he has left the Army, which is left to the Ministry of Pensions to solve. In the early stages of the war, the sudden influx of large numbers of wounded men demanded a sudden expansion of hospital accommodation, while the terrible sepsis of wounds from the battlefields of France presented a difficulty for which surgeons had not been prepared by previous experience.

The pressure on hospital accommodation became such that men were discharged from the Army and from hospital with their wounds healed, but not cured of physical disability and unable to earn their living. Among these cases were those of malunited, ununited fractures requiring operative treatment and bone grafting, old cases of nerve injuries requiring suture, ankylosed joints, and contractures. Sir Alfred Keogh, said the lecturer, instructed him to start the first orthopædic centre in Liverpool with a view of concentrating under one roof the practice of orthopædic principles and the equipment necessary for the restoration of function—continued treatment. Every orthopædic centre, he said, consisted of (1) a staff of surgeons of special experience in orthopædic work, operative, manipulative, and educational; (2) surgeons with experience in operative surgery, who, though not specialising in the work, only need experience to fit them to take charge of wards in new centres; (3) younger surgeons who, before going abroad, will have the advantages of special training; (4) auxiliary departments—neurological, electric, massage and re-education, hydrological, gymnastic, and the curative workshops—each under a medical man who has experience of the particular methods of the treatment he directs.

The *workshops*, Sir Robert Jones said, had proved of considerable value in the orthopædic centres, acting directly as a curative agent when the work done gives exercise to the injured limb, and indirectly through the result to the patients of being put to useful work. For the initiation and equipment of the workshops Sir Robert Jones acknowledged a deep debt to King Manuel and the British Red Cross Society.

The orthopædic problem, he said, could be divided into two distinct parts, preventive orthopædics and corrective orthopædics, the latter being more especially the department of the trained orthopædic surgeon, the preventive requiring the help of every surgeon who has to treat wounded men at any stage, especially the early stage.

Concerning *gunshot injuries of the femur*, he said: "Gunshot injuries of the femur constitute, in my opinion, the tragedy of the war, not only by reason of the fatality by which they are attended, but also because of the deformity and shortening which are so often associated with them. Recent convoys show a marked improvement upon earlier ones, but much more remains to be done and the question is very urgent. From abroad I have received bitter complaints of the want of continuity of treatment in this country; and, from our experience here, we are forced to the conclusion that while cases arrive from certain hospitals abroad most admirably fixed, they arrive from other places leaving much to be desired. The question of fractures of the femur is essentially one of *preventive orthopædics*. Our centres are constantly dealing with deformities following this injury. Many cases come with four or five inches of shortening and with every variety of the classical deflections. Is there no way in which the better results could be multiplied and the bad results avoided?"

The remedy, Sir Robert Jones continued, consisted in leaving these fractures in the hands of specially trained men retained for the work and proceeding in association on a common plan. The plan he defined as, first, the concentration of all fractured femurs in special and large hospitals at each base, staffed by keen, well-trained surgeons with mechanical aptitude and with security of tenure, for experience would constantly increase the rapidity and efficiency of their work. They should have selected and more or less permanent nurses and orderlies to help them in team work The hospitals should be visited by an inspector of fractures, acting in conjunction with the consulting surgeons of the various districts, and no case should be evacuated in opposition to his instructions, while he should have a deciding voice in the selection or removal of any member of the surgical staff. One or more of these hospitals should be chosen as an educational centre, and all young surgeons who can be spared from time to time should undergo a training. Certain nurses and orderlies should also be trained, and in this way teams can be prepared to do rapid and efficient work at the casualty clearing station.

Two fundamental principles must be sacredly adhered to, said the lecturer, (1) efficient fixation in correct alignment at the earliest possible moment, (2) continuity of treatment. "Death," he pointed out, "usually occurs from shock, the result of direct injury, the shock being often increased by exposure and the movement of injured tissues during transport. Fixation, therefore, should not be delayed a moment. For the purpose of rapid, simple, and efficient fixation, there is no splint to compare with a Thomas. Since November, I learn that in many divisions these splints have been supplied to the regimental aid-posts. They should be supplied to all. These splints can be rapidly applied over the trousers, and extension made by a pull on the boot. Twenty or thirty cases can be dealt with in an hour by a trained team of orderlies; I allude, of course, merely to the mechanical fixation of the fracture. The wound is next thoroughly overhauled in the casualty clearing station. When this can be done with the limb well extended in the splint it is an advantage. This extension of the limb undoes all kinks and folds wherein discharges may collect. When the wound is thoroughly dealt with and the limb fixed for permanent treatment the case is sent down the line whenever it is safe. Experience has proved that, since such cases cannot be kept indefinitely at the casualty clearing stations.

[1] This address will appear in full in the British Medical Journal.

they should be sent down at the earliest possible moment after the recovery from shock before sepsis has had time to spread and before the danger of secondary hæmorrhage has set in. Cases do best at the base hospitals when they are received there during the first three days. This secures for us the second important principle—continuity of treatment. The teams at the regimental aid-posts, the casualty clearing stations, and the base hospitals will have a common understanding, and no unnecessary change of methods is likely to occur. How are we at home to continue the work in its final stage? An Army Council Instruction has been issued that all fractures of the femur which come to this country should be sent to orthopædic centres, and in case these centres are full to specially selected hospitals. If this instruction is faithfully adhered to our results will be enormously improved."

After warning his hearers against the premature removal of mechanical supports to the injured femur, the lecturer pointed out that what had been said about fracture of the femur was true of *fractures of other bones* of the limbs; though the danger to life was less the frequency of deformity was as great. Fractures of the bones of the leg with a backward sagging at the site of fracture due to inefficient support; or a valgus deformity at the seat of fracture deflecting the body weight on to the inner side of the foot; non-union or delayed union in fracture of the humerus, especially when the fracture is through the middle third. In fractures of the lower end of the humerus a backward thrust of the elbow often occurs, while an ankylosed elbow is a tragedy. Two serious dangers in compound fractures of the forearm were mentioned: one vicious union between the two bones, and the other is sagging or convexity to the ulnar side.

In regard to *gunshot injuries of joints*, the results of primary excision of joints, the lecturer said that these were filtering into the orthopædic centres, and surgeons abroad should know that the functional results were very bad. Flail knees, flail elbows, flail shoulders, many of them suppurating, presenting constant and serious problems to the surgeon. If the conditions admitted, it was obvious that the greatest conservatism in the treatment of joints should be practised, and with the growing ascendancy which our surgeons abroad are gaining over sepsis Sir Robert Jones held that any routine excisions should be discouraged, but a procedure which might have an exceptional value should be hedged by clearly defined instructions and limitations. He acknowledged the constant reception from certain sectors of gunshot injuries to joints, especially knees and shoulders, where immediate excision of the wound had been practised with results often surprisingly good, and explained in some detail the after-treatment of such excisions.

Injuries of muscle and nerve.—Torn muscles, he pointed out, must not be allowed to become puckered by dense scars, but rather the limb must be put in positions which will prevent the formation of undue contractures, a question which called for great judgment, the surgeon having to watch whether contracture or overstretching in the injured muscle is taking place and act accordingly. Generally speaking, contractures occur in flexors and overstretching in extensors; but a hard-and-fast rule cannot be laid down, especially in positions in which gravity plays an important part. In recovering nerve injuries, whether after bruising of the nerve followed by spontaneous recovery or after suture for a divided nerve, the muscles supplied by the nerve must be kept continuously relaxed by splinting the limb.

Corrective orthopædic surgery.—The lecturer continued: "The question is, How are we to establish recognised methods? One means already in existence is within our orthopædic centres by encouraging staffs of the various hospitals to meet and discuss their difficulties, their methods and results by holding conferences at the various centres. The next is that each centre should be used as an educational centre, open to all who wish to see the methods practised there. Some system should be organised by which all the younger surgeons should be sent for a few weeks to do work in these hospitals; first, that they may compare the results with their expectations when they treated similar cases in the first instance on the field; secondly, that by observing and assisting in the work of corrective orthopædics they may learn how to practise preventive orthopædics. It must be remembered that a part of corrective orthopædics consists in deliberately inflicting the original injury by operating and then treating the case over again. This is especially the case in the treatment of malunited fractures, where the operative treatment consists in remaking the original fracture and then setting it in better position. The orthopædic surgeon has the advantage that he waits until the risk of recurring sepsis is practically absent; but he labours under the disadvantage that scars and contractures have occurred as the result of the original sepsis, which make it difficult to get the bones into correct position. The treatment of stiff joints again presents a whole series of different problems. In civil practice after a sprain or injury of a joint a few adhesions often occur which interfere with its free action, and, moreover, any movement which stretches these adhesions causes pain. The treatment, as a rule, is simple—forced manipulation to break down the little fibrous bands of adhesions. This class of case very rarely occurs in military surgery—so rarely that I would almost say a surgeon without considerable experience of manipulative methods where he is tempted to manipulate a stiff joint after gunshot injuries had better pause, reflect, and refrain. I emphasise this because I have seen so many cases in which joints have been forcibly moved with disastrous results."

A series of hypothetical cases, types of which occur over and over again as varieties of stiff joint, were then explained in detail, of which the following was an example.

"A case is presented with an ankylosed shoulder, elbow, and wrist, with the potentialities of movement confined to the thumb and two adjoining fingers. The shoulder is abducted, the elbow extended, the wrist palmar-flexed, the muscles ischæmic. The question arises, Can any use be made of this apparently useless limb or should it be amputated? On inquiry the surgeon finds that the patient can shrug his shoulder—the scapular muscles are acting. The first procedure is to develop power in the thumb and two fingers, then to ankylose the wrist in dorsiflexion and the elbow at the angle best suited to the patient. An osteotomy is next planned in order to get the arm abducted. In a few weeks the scapula carries the humerus through a long range of movement, and the patient has secured a limb much more useful than the best of artificial arms."

Sir Robert Jones concluded by paying a high tribute to his American and British staffs, and to professional brethren who by word and deed have encouraged the work and lessened the labours.

Colonel ANDREW FULLERTON, consultant in France, agreed with Sir Robert Jones as to the necessity for more coöperation between the surgeons in France and those in England. Only in this way could the after-results of treatment at the front be ascertained. In France the importance of collaboration between the consultants of the armies and those of the base had been recognised and more frequent meetings were being arranged for. It only remained to establish a similar state of affairs between consultants in France and England. With regard to the scheme for the establishment of orthopædic centres outlined by Sir Robert Jones, he was glad to be able to state that such a scheme was actually at the present moment in operation in France, one hospital in each large base having been chosen for this purpose. Surgeons who have shown special aptitude in the treatment of fractures are being chosen as opportunity offers, and these officers will be concerned only with this branch of surgery and will have security of tenure. These hospitals are being organised as educational centres and as places for research. With regard to the question of excision of joints, cases occur in which this is undertaken to remove grossly infected comminuted bone or to provide drainage. Many limbs have been saved by this procedure. It was disappointing to hear that the orthopædic results had been so unsatisfactory and that flail joints were frequent. This knowledge will, however, be of service to the surgeon in France, who will be encouraged to save as much bone as possible and to resort to excision only when imperative. Referring to criticisms by Colonel Mayo Robson in regard to too wide excision of wounds and guillotine amputations at the front, Colonel Fullerton said that the complete excision of wounds, followed by primary or secondary suture, was one of the most life-saving and time-saving advances of the war. The large wounds to which Colonel Mayo Robson took exception may have been necessary for wide destruction of tissue or

gas gangrene of muscle. The guillotine operation had been no doubt too often performed in the earlier part of the war, but had now been relegated to its proper place, and it had a place in war surgery. The great principle in amputation, where one could not be sure of obtaining healing by first intention, was to leave as much of the limb as possible so that if a secondary operation became imperative the surgeon who finished the case might have sufficient material with which to fashion flaps in a position suitable for the application of artificial limbs.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OPHTHALMOLOGY.

Disturbances of Vision by Cerebral Lesions.

AN ordinary meeting of this section was held on Dec. 12th, 1917, Mr. WILLIAM LANG, the President, being in the chair.

Lieutenant-Colonel GORDON HOLMES submitted an account of exhaustive researches, which had been carried out by him at hospitals in France, on Disturbances of Vision by Cerebral Lesions, and the paper was accompanied by a number of photographs and diagrams exhibited by means of the epidiascope. This paper was a sequel to one presented to the section 18 months ago in conjunction with his colleague Colonel Lister, on the disturbances of vision produced by gunshot injuries of the visual cortex and of the optic radiations. Certain conclusions on the cortical representation of the retina were drawn, and particularly on segmental correspondence of different areas of the retina with separate zones of the cortical visual area.

The chief conclusions set out in the former paper were:—

1. The upper half of each retina is represented in the dorsal, the lower in the ventral part of each visual area.
2. The centre for macular or central vision lies in the posterior extremities of the visual areas, probably in the margins and the lateral surfaces of the occipital poles. The macular region has not a bilateral representation.
3. The centre for vision subserved by the periphery of the retinæ is probably situated in the anterior end of the visual area, and the serial concentric zones of the retina from the macula to the periphery are probably represented in this order from behind forwards in the visual area.

The foregoing agree with those already arrived at by Inouye from a study of cases in the Russo-Japanese War, and by others. A large number of cases seen since the last communication to the Section harmonised with these conclusions.

The most interesting local defects in the fields of vision Colonel Holmes stated to be central and paracentral scotomata, which are very common in all moderate injuries of the occipital lobes. Injury of the poles of both hemispheres may cause complete loss of central vision; a unilateral wound produces homonymous scotomata in the opposite halves of the fields. A common type of case is that of pure lateral paracentral scotoma, of which an instance was that of a man whose helmet was penetrated by a shrapnel ball, rendering him quite blind until next day. No subjective visual phenomena were noticed. From a small penetrating wound softened brain extruded, just to the right of the mid-line, and 1 inch above the inion. The radiograph showed much depressed bone, but no foreign body. Following removal of brain tissue and bone the sight was quickly recovered. A week later there was a large left homonymous paracentral scotoma, but peripheral vision was unaffected, and the colour fields were normal in the right halves, but there was no perception of either red or green to the left of the middle line. In all patients with inferior unilateral paracentral scotomata the injury involved the tip or posterior portion of one occipital lobe, at, or immediately above, the level of the calcarine fissure, and usually the size of the scotoma had a relation to the depth of the wound. Some cases of bilateral inferior scotomata afford valuable evidence on the subject of cortical localisation. Isolated superior paracentral scotomata are much less common, and in the few cases seen by various observers the lesion appeared to involve the lower part of the area striata, indicating, therefore, that the retina immediately below the macula is represented in the lower portion of the calcarine area. He quoted three cases to confirm that assumption. There now seems available sufficient evidence to warrant the conclusion that the upper halves of the retina are projected on to the dorsal part of the visual area, and the lower halves on to its ventral portion. Macular and perimacular vision are represented in the most posterior part of this area. Still, other problems require consideration, and they can best be studied in cases with paracentral scotomata. Usually, the sector scotomata lie between the vertical line through the fixation point and one of the oblique radii.

Colonel Holmes next dealt with the question of the cortical representation of peripheral vision. In the previous communication Colonel Lister and he could only, by a process of exclusion, suggest that vision in the periphery of the fields was represented in the anterior portion of the cortical visual area. It was not to be expected that many cases suitable to afford definite evidence on this would be seen, as perforating wounds which could involve the anterior portion of the area striata would very likely involve the optic radiations also, and so cause intensive or irregular areas of blindness. A recent case of Riddock, however, gives valuable positive evidence of the localisation of peripheral vision. The man in question had considerable peripheral contraction of both visual fields; a rifle bullet, and, later, fragments of bone, were removed from the great longitudinal fissure between the two hemispheres, at such a level and depth that the anterior portion of the calcarine area was probably injured. Colonel Holmes himself had recently seen a valuable case from this standpoint, and he narrated it in detail. The cases seen afforded some positive evidence that peripheral vision is represented in the anterior portions of the calcarine area. And when associated with the fact that peripheral vision is never affected by local lesion of the posterior part of this area, the hypothesis becomes very probable if it is admitted that the visual sphere at least is roughly approximate with the area striata. Destructive injuries of the optic radiations generally produce a complete hemianopia, in which the blindness may or may not reach the fixation point, or large irregular areas of blindness. Occasionally the visual defect is more regular, and these cases affect the important question whether the fibres of the radiations which carry impressions from the retina and end in definite portions of the visual cortex are arranged in order according to the origin of the impressions they carry and to their exact termination. Colonel Holmes had seen a number of cases in which quadrantic hemianopias or other defects of the fields resulted from wounds of the radiations. He quoted some of these. He was forced to the conclusion that the fibres of the radiations are arranged regularly in laminæ or series, according to the impulses they carry. With regard to the course in the radiations of the fibres concerned with macular vision, observations suggest that these have a distinct path of their own, but he had not yet seen a case in which a paracentral scotoma or an isolated affection of central or pericentral vision could be attributed to a lesion of the radiations.

Colonel Holmes then proceeded to discuss the nature of the lesions, taking, first, concussion. In many of his patients the defects remained unaltered at repeated examinations extending over considerable periods. But in others there was a progressive diminution of the blind area, sometimes rapid, sometimes slow. In such a highly organised function recovery can hardly ever be due to vicarious representation or the assumption of the functions of the destroyed cortical areas by other centres. When the defects persist for a considerable time after the infliction of the wound he did not doubt they depend on a simple destructive lesion. But in the earlier stages of gunshot injuries of the head it is not uncommon to find a complete hemianopia or a large area of total blindness disappear in a few days or weeks, probably by recovery from the centre to the periphery. But peripheral vision often reappears before the central or pericentral. He attributed the condition when recovery was quick to an œdematous swelling of the areas concerned, analogous to that which occurs in the myelin sheaths of the spinal cord. He could not say whether a molecular disturbance might contribute to the defect. The rapidity of recovery argued a condition short of the destruction of anatomical integrity. It had been common to find a zone of partial vision around the scotomata or on the borders of a quadrantic or incomplete hemianopia. But in most of the cases examined more than three weeks after the onset of the blindness the margins of the scotomata were remarkably sharp. He passed on to discuss the mechanism and function of peripheral vision, and from that to disturbances of colour perception caused by cerebral lesions. He said it has not been conclusively shown that colour perception may be completely lost in any part of the field when that of light or white is undisturbed; many of the hemiachromatopsias have been instances of hemiamblyopia. He had frequently

observed among his cases that red and green test objects could not be recognised in certain regions, often in homonymous halves of the visual fields, but in every instance visual sensibility to white test objects of the same size was reduced. His observations led him to the conclusion that an isolated loss or dissociation of colour vision is not produced by cerebral lesions.

The paper concluded with a discussion of disturbances of visual attention and loss of visual orientation and appreciation of depth. He summarised the conclusions arrived at as follows:—

1. The upper half of each retina is represented in the dorsal and the lower in the ventral part of each visual area.
2. The centre for macular or central vision lies in the most posterior part of the visual areas, probably on the margins and in the lateral surfaces of the occipital poles. The macula has not a bilateral representation.
3. The centre for vision subserved by the periphery of the retinæ is situated in the anterior portions of the visual areas, and the serial concentric zones of the retinæ from the macula to the periphery are probably represented in this order from behind forwards in the visual areas.
4. Those portions of the retinæ adjoining their vertical axes are probably represented in dorsal and ventral margins of the visual areas, while that in the neighbourhood of the horizontal axes is projected on to the walls and the floor of the calcarine fissures.
5. Severe lesions of the visual cortex produce complete blindness in the corresponding portions of the visual fields or, if incomplete, an amblyopia, colour vision being generally lost and white objects appearing indistinct; or only more potent stimuli, such as objects moved sharply, may excite sensations.
6. The defects of vision in the fields of the two eyes are always congruous and superimposable, provided that no disease or injury of the peripheral visual apparatus exists.
7. Lesions of the lateral surfaces of the hemispheres, particularly of the posterior parietal regions, may cause certain disturbances of the higher visual perceptual functions with intact visual sensibility as loss of visual orientation and localisation in space, disturbance of the perception of depth and distance, visual attention loss, and visual agnosia.

These conclusions, he said, would serve as a working hypothesis for further observations.

RÖNTGEN SOCIETY.—At the meeting of this society held on Jan. 1st, Mr. Carl Darnell read two papers communicated by Dr. Coolidge, of the General Electric Company's Research Laboratories, U.S.A. The first dealt with a new form of Coolidge tube, in which the anticathode consists of a block of copper faced with a small button of tungsten. This is fixed to a thick stem of copper, which passes out through the glass neck of the tube and terminates in a fin radiator. The anticathode is thus kept cool, and does not in consequence emit electrons as in the case of the earlier Coolidge tube, in which the whole of the anticathode speedily becomes red hot. The new tube therefore so completely rectifies current that when an alternating potential is applied the current will pass in one way only. In the second paper, by Dr. Coolidge and Mr. Moore, the Portable or Field X Ray Outfit of the United States Army was described. A petrol-electric unit supplies alternating current at 110 volts to a transformer arranged to give both high tension and heating currents for the new radiator type of Coolidge tube. For simplicity of control the tube is worked at a constant potential of 5 in. equivalent spark-gap and the current is adjusted to 5 milliampères for continuous running of the tube or to 10 milliampères for short periods. An electrically actuated control on the throttle of the engine maintains constant output. The small size of the bulb, 3½ in. in diameter, enables a close-fitting lead-glass shield to be employed; this is made in two parts and completely surrounds the tube, a suitable aperture permitting egress of the rays.

ROYAL PRINCE ALFRED HOSPITAL, SYDNEY.—The thirty-third annual report for the year 1916 of this institution shows that during the year 6330 patients were admitted, and of these 3936 were discharged cured, 1615 relieved, 420 unrelieved, while 398 died. The number of beds available was 410. It is pointed out that an increase of nearly 10 per cent. in the mean number of resident days of patients is due chiefly to the need for keeping in hospital some classes of venereal cases, particularly children, for a long period. Like the hospitals in the mother-country, the institution has suffered from increased price of supplies and shortage of staff.

Reviews and Notices of Books.

A Text-book of General Bacteriology. By EDWIN O. JORDAN, Ph.D., Professor of Bacteriology in the University of Chicago and Rush Medical College. Fully illustrated. Fifth edition, thoroughly revised. London and Philadelphia: W. B. Saunders Company. 1916. Pp. 669. Price $3.25.

JUDGING by the rapidity with which successive editions of this book have appeared—five editions since 1908—it would seem to have been adopted as a text-book by a considerable body of students. The lucidity and systematic arrangement which it shares with similar American works make it very suitable as a general introduction to bacteriology, and the more so since the subject is treated as part of a general scientific education and not merely as part of the technical instruction of the medical student, though it will serve his purpose.

The previous editions having been reviewed at length in THE LANCET it will suffice to state that it has the usual arrangement of the text book designed for the medical student though with a slightly wider range, and to mention some of the changes in the present volume. The additions and insertions are neither very numerous nor important, and, indeed, some sections, such as those which treat of the anaerobes, seem rather antiquated in the light of the immense amount of work which has been done on these organisms during the present war. The added chapter on typhus fever is disappointing, as it is written in a very uncritical spirit with little reference to any but American work and without regard to the later investigations of Nicolle, Rocha-Lima, and others. The author adopts the view that the bacillus described by Plotz and his co-workers is the cause of the disease. The important work by American investigators on the varieties of the pneumococcus and their clinical significance has been introduced, and the official American variation of the Rideal-Walker method for the standardisation of disinfectants. The skin reaction described by Schick is referred to, but without consideration of the large amount of work done in New York and elsewhere, and there are short paragraphs on Hodgkin's disease and other minor matters.

The book, as was the case with previous editions, is well produced.

1. *Dysenteries, Choléra Asiatique, and Typhus Exanthématique.* Par H. VINCENT et L. MURATET. Précis de Médecine et de Chirurgie de Guerre. (Collection Horizon.) Paris: Masson et Cie, Editeurs. 1917. Pp. 227. Price 6*s.*
2. *Electrodiagnostic de Guerre.* By Professor A. ZIMMERN and Dr. PIERRE PEROL. (Collection Horizon.) Same publishers. 1917. Pp. 155. Price 4 fr.

1. THIS little French manual, which gives an excellent account of dysentery, cholera, and typhus fever, has been translated into English under the able editorship of Dr. G. C. Low. An important section deals with amœbic dysentery, the views expressed coinciding fairly closely with those obtaining in this country. The authors, however, in enumerating the different etiological agents causing dysentery include a form due to *Chilodon dentatus* observed by Guiart; but *C. dentatus* is a free-living protozoon commonly found in water, and can have nothing to do with causing bowel troubles, as it is not a parasitic form. This error is an unfortunate example of the perpetuation in the literature of a fallacious statement once made and copied from author to author. The important question of nomenclature is raised in regard to the pathogenic amœba causing amœbic dysentery. The name *Entamœba histolytica*, as the authors rightly point out, is inconsistent with the rules of zoological nomenclature, but the names they propose in its stead are equally erroneous, and the matter will have to be settled at some future zoological congress. Omission of any reference to the new English work on emetine-bismuth-iodide is unfortunate, as better results appear to be obtained with it than by the old hypodermic method, which is likely to disappear. The sections devoted to treatment are not full enough to supply all the reader's needs, and the entire omission from the book of morbid anatomy is to be deplored. Even if not dealt with fully, a synopsis would have proved of value. In bilharzial literature the authors

are not quite up to date, no mention of Leiper's brilliant work being included, when they deal with the Schistosoma as a cause of one of the helminthic dysenteries. Typhus is well described, and includes recently ascertained data, while the section on cholera contains all the essential facts. The work will prove useful to those whose lot it is to combat and treat these dangerous plagues, and the English edition will bring it into contact with a larger group of physicians than would otherwise have been the case.

2. This new volume of a useful series contains in convenient form the essentials of diagnosis by electrical methods under war conditions. The preface concludes with the wise remark: "C'est le médecin qui fait l'électrodiagnostic qui lui donne sa valeur."

The Psychology of War. By JOHN T. MACCURDY, M.D. London: Heinemann. 1917. Pp. 68. Price 2*s.* 6*d.* net.

THE writer of this little book is a lecturer in medical psychology in Cornell University. Its main object, we are informed, is to ascertain whether the instinct for war is "so deeply rooted in the soul of men that it can never be eradicated," or whether it is "rather to be considered as a disease of the mind of the race, which can perhaps be prevented like insanity in the individual." The author expresses the opinion that "war is a disease," a "social malady," that it is "the natural outcome of fundamental human tendencies," and that, nevertheless, it "marks the highest level of national consciousness that is ever reached." He points out that the forces leading to war are dammed up by repression during peace, and in his attempt to establish an analogy between the phenomena of war and of mental disorder, believes that war is preventable by some form of mental hygiene, by the discovery of some substitute "which will give cohesiveness to the herd, but at the same time not detract from the loyalty of its citizens to that larger group, the human race." Considerable space is given to an account of the views of Freud, Ernest Jones, and Trotter on the psychology of war, and the author tries to reconcile these views by suggesting that Trotter's "herd-instinct" is merely the repressive force behind Freud's "unconscious, primitive instincts" of selfish violence. A chapter on the entry of the United States into the war is added as a postscript.

Philistine and Genius. By BORIS SIDIS, M.A., Ph.D., M.D. Revised third edition. Boston: R. G. Badger. Pp. 122. Price $1.00 net.

THIS is an address—a sermon in 18 chapters—given in 1909 to the Harvard Summer School, to which a preface and an essay on Precocity in Children are now added. The lecturer urges the awakening of "man's genius by giving the child" (from his second or third year, be it remarked) "an early, a 'precocious' education," before his plasticity of mind and body has given place to the "hide bound" habits of the adult. The child should be taught to break up habits rather than to form them. Routine is to be avoided, variability to be cultivated, thus providing against inhibition of reserve-energy and the extinction of individuality. Recognition of evil is more important than the recognition of good. The child must be guarded against evil fears, as childhood is the source of all psychopathic disorders. "We trust our unfortunate youth to the Procrustean bed of the mentally obtuse, hide-bound pedagogue. We desiccate, sterilise, petrify, and embalm our youth in keeping with the rules of our Egyptian code and in accordance with the Confucian regulations of our school-clerks and college mandarins. Our children learn by rote and are guided by routine." This quotation will suffice to indicate the style and purport of the address.

A History of Bristol Royal Infirmary. By G. MUNRO SMITH, M.D., L.R.C.P. Lond., M.R.C.S. Bristol: J. W. Arrowsmith; London: Simpkin, Marshall, and Co. Pp. 508. Price 12*s.* 6*d.* net.

A PATHETIC interest attaches to this valuable record of one of the oldest provincial hospitals, for the author, who had compiled the MS. of the book prior to the outbreak of war, did not live to see the publication of the result of his labours. Dr. Munro Smith, who died on Jan. 13th of last year, was consulting surgeon to the Bristol Royal Infirmary, whose medical staff, as well as a wider public, will be grateful to his memory for the vivid picture of medical and social life in the eighteenth and nineteenth centuries presented in the history of the institution. The book was compiled from a collection of documents, cuttings, and memoranda made in the first instance by a namesake of the author, one Richard Smith, surgeon to the infirmary from 1796 to 1843. The infirmary goes back to 1736, and from that date to 1906 when the munificent liberality of Sir George White freed it of debt, the story is told of the foibles of human nature, of the efforts for the amelioration of the lot of the sick poor, and of the difficulties successfully overcome in the battle against disease. References are made to cock-fighting, bull-baiting, duelling, and Gretna Green marriages, and to times when wards were lighted with candles costing 6*s.* 3*d.* a dozen, and when patients were exhorted by notices in the wards not to lie in bed with their clothes on. The ingenuity of a workman is recorded in preventing the bursting of a water-pipe in the infirmary in 1797; in so doing he anticipated the now well-known principle of the water ram. The book is well illustrated.

JOURNALS.

The Military Surgeon.—In the issue of this journal for November, 1917, Major R. N. Greene, Medical Corps, Florida National Guard, describes some personal experiences in aviation. He was, secretly, much disinclined to commence his first flight, but he was dressed for it and had to go, though he felt that the belt which secured him to his seat, as it was drawn tight, was an official proof of inevitable disaster. But things improved once they got away. The view of the country from 3000 feet, when it looked like a well-kept tennis lawn with roads running out to meet the sky and railways looking like contour lines, was interesting. The noise of the machine and the rush of the air give a sensation such as one might have standing at the edge of a great roaring waterfall, into which one feared one might be drawn. Once above the clouds there is a spotless blue vault overhead, and below, on the white surface, is the shadow of the aeroplane surrounded by a wonderful halo of colour. The flight is followed by a great exhaustion, after recovery from which one wants to try again. Also after an unlucky, but not disastrous, experience the aviator promises himself to give up flying, but when the exhaustion has worn off he is eager to try again and learn to triumph over that particular difficulty. Major Greene found that blood pressure was raised at 10,000 feet from 120 to 200, and he thinks that flying may eventually cause arterio-sclerosis and cardiac hypertrophy. He suggests that some fatal falls are to be ascribed to fits of unconsciousness, and that medical examination in doubtful cases of physical fitness should be controlled by giving the candidate an opportunity to fly as a passenger, the mental equipment of the aviator being almost as important as the physical, so many and confusing are his problems, so rapidly and so appropriately must he meet them.

Maternity and Child Welfare. December, 1917. Vol. I., No. 12. Price 6*d.* net.—Mrs. Eckhard's article on the Nursery School will repay perusal, particularly that part of it which deals with the fear of undermining parental responsibility. "In normal life it may be taken for granted that the mother will keep her children with her unless she sees that it will be better for them to go to the nursery school. Probably it will be better. If the mother is not out at work, she is nevertheless often sufficiently hard-worked at home to need the relief of placing her small children where they will be well cared for. The experienced teacher will be a great help to these mothers. ..... If the teacher is better prepared by training for her task, the mother is better prepared by experience, and they will together produce more satisfactory results than either could do alone." But the whole thing should be read. Mrs. Jessie White's second article on Montessori Reforms is thoroughly practical and should be very useful to nursery workers, for its criticisms, though frank, are not unfriendly, and the suggested reforms, though difficult, are not impossible.

IN the *Archives de Médecine et Pharmacie Navales* for October, Dr. Tribondeau, of the French Navy, details the effect of antityphoid inoculation on the blood of 150 men, inoculated by him on the same day. He gave to each man a single injection of 1·1 c.cm. of a suspension in oil of the three bacilli in equal parts, 7000 million bacilli altogether. He observes that his method is superior to that ordinarily used,

for only a single injection is required, and, when oil is used as the excipient, neither local discomfort nor febrile reaction occurs. Ten of the men were sent him daily for examination, and he found that by the sixth day their blood generally agglutinated each of the bacilli in a 1/10 dilution, in 1/100 on the eighth, and in 1/500 on the tenth day. It did not go higher for paratyphosus, but reached and remained at 1/1000 for typhosus for the next fortnight. At the end of the month agglutinating power for each infection fell off equally and rapidly. The power of deviating complement also began to appear about the sixth day, and remained in all during the latter half of the month, when it also began to disappear. As these men have been sent away on general duty we shall shortly see, he points out, whether the oily suspension of bacilli immunises them quite as well as the watery suspension more usually employed. The same author has a paper emphasising the importance of examining every chancre for spirochætæ before it has had any treatment except a boiled-water compress, and he details his rapid method of staining the smears. Sir Ronald Ross's paper on the Treatment of Dysentery is translated from THE LANCET into French.

New Inventions.

APPARATUS FOR THE TRANSPORT OF FRACTURED FEMURS.

THE mechanical contrivances for the treatment of fractured femur in this war are constantly undergoing modifications in the endeavour to deal with the varieties of conditions produced by gunshot wounds of the thigh. It would appear that in the hands of the expert the results obtained in a series of cases by any given method compare favourably with those obtained by any other. Success depends in the majority of cases upon the personal element involved, provided that the first principles in the treatment of fractures generally have not been ignored.

In the conflict of opinion a most important consideration is often ignored—namely, that of transport. Apart from active service conditions, the treatment of fractures of the thigh, whether simple or compound, from the mechanical aspect presented few difficulties since the question of transport was not involved. Herein lies the chief difficulty. Under active service conditions it cannot be guaranteed that any case of fractured femur will remain for any length of time in any one place until such a case has reached its ultimate destination in England.

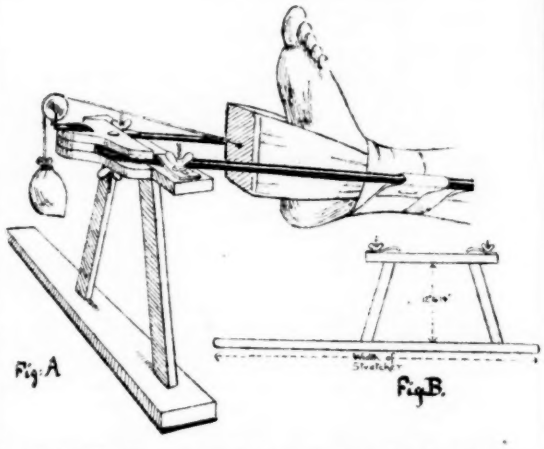
During a recent period of six months at Netley it has been possible to observe the results of the overseas treatment of fractured femur from the mechanical aspect. One cannot say that the majority of cases admitted, whether of recent origin or not, were satisfactory. The almost universal method of treatment was by means of a Thomas splint with a "tie on" extension. The majority of cases, up to the time of admission there, had known no other, and these were almost without exception unsatisfactory as regards position and alignment of the bone. The few exceptions under this category were those where inquiry showed that constant daily readjustment of the extension had been carried out.

The general conclusion arrived at was that the "tie on" extension amounted to no extension. Certainly in no case admitted could the "tie on" extension be said to be doing its work. In most cases it was so loose that it did not even serve to steady the limb. In many cases which had been treated by a weight extension, the "tie on" extension being resorted to for transport, much of the good done as regards alignment and position had been nullified in the process of transport, the patient himself complaining bitterly of the pain and discomfort he had suffered since the weight extension had been removed.

In those cases where union had occurred overseas without a weight extension the results as regards position, alignment and amount of shortening may be said to have been, with very few exceptions, unsatisfactory. The same criticism applies to the majority of cases treated by the Wallace-Mawbray splint for transport.

In both cases the objections are two. 1. The amount of expert attention required to maintain extension at all, which of necessity cannot be guaranteed during transport. 2. The fact that the amount of extension is unknown and subject to constant variation. With a weight extension it is possible to gauge the precise amount of extension required for each case and to maintain that amount as a constant factor, or vary it precisely in accordance with the requirements of the case.

There is no doubt that the best splint for transport is the Thomas, with this essential reservation, that *there must be in addition a weight extension.* For the purposes of transport this weight extension must be self-contained, and for this purpose the following apparatus is suggested. A wooden



bracket (Fig. A), composed of an upper and under piece, is clamped to the end of the splint by a bolt and butterfly nut. The bolt lies within the curve of the end of the splint, and between the upper and under parts of the bracket, beyond the splint, rests a block to maintain rigidity. Attached to the upper surface of the bracket is a pulley wheel to carry the extension cord (Fig. A). For transport the splint is clamped to a wooden support (Fig. B) which rests on the stretcher.

In practice this apparatus has proved satisfactory. The advantage is that once the amount of extension has been applied it remains constant, requires no attention or adjustment, and nothing but deliberate interference can disturb it. In hospital the support may in some cases be employed, or the end of the splint may be rested on the foot-rail of the bed. When there is no rail, and generally, the best plan is to support the splint by a hook and cord passing over a pulley on an upright post. By this means not only is the precise angle comfortable to the patient assured, but the splint can also be raised to a steep angle and secured there if it is desired to get at the posterior surface of the limb for dressing purposes. If the post is so placed that the supporting cord to the splint pulls at an angle, an additional advantage is obtained since the tendency then is to pull the ring of the splint away from the perineum and thus avoid pressure and the possibility of pressure sores in this region.

For the efficient support of the limb in the splint strips of Sinclair's zinc should be used or a similar material giving a rigid trough in which the limb may lie at rest. Flannel bandages or slings of any such material should not be used; their tendency to stretch cannot ensure a uniform support to the limb. One has only to see the condition of affairs in such cases where strips of bandage have been used as slings to be convinced of their entire futility as an efficient positive support to the limb.

It is in the hope that the principle of weight extension in the treatment of fracture of the femur, both in hospital and continued during transport, will be adopted that these suggestions are made, and also in the earnest hope that the "tie on" extension be definitely condemned.

J. FRANKLAND WEST,
Captain, R.A.M.C., B.E.F.

N.B.—The pulley bracket is a modification of an iron pulley bracket designed by Lieutenant H. L. Wilson, R.A.M.C., and used by him at Netley, but in contrast gives perfect security, and is a universal fit to any Thomas splint.

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H.M.S.———, 27-7-17.

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It is a normal regulator of the gastro-intestinal functions; consequently it improves the metabolic exchanges in the entire organism.

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E———, Scotland, 9th Oct., 1917.

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C. A——, M.D.

LITERATURE, &c., ON APPLICATION.

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THE LANCET.

LONDON: SATURDAY, JANUARY 12, 1918.

Gunshot Wounds of the Chest.

SURGICAL interference justifies itself in direct proportion to the danger of the condition with which it deals, and it is now generally recognised how fatal are many of the gunshot wounds of the chest wall if left untreated or if treatment is delayed from any cause for more than from 24 to 30 hours after infliction of the wound. Lieutenant-Colonel T. R. ELLIOTT recently quoted 10 to 15 per cent. as the minimum number which die in medical units from the immediate severity of their injury,[1] and Dr. PIERRE DUVAL gives even a higher figure. And the number of chest wounds on which this percentage is reckoned remains high in comparison with that of head wounds, which has fallen so markedly after the universal adoption of a steel helmet. To the pioneer work of Médecin-Chef DUVAL, as well as of Colonel G. E. GASK and Colonel H. M. W. GRAY, we owe the incentive to a more active early treatment of chest wounds; the application, in fine, to these wounds of the same principles of treatment as have been found effective in gunshot wounds of other parts. Excision of the wound, removal of broken and splintered ribs, removal of foreign bodies and blood clot, cleansing and suture of the lung, followed by immediate suture of the chest wall: these are the measures which, with skilled coöperation between surgeon, physician, and anæsthetist, have proved effective in reducing the early mortality. In the happy phrase of Professor R. GRÉGOIRE and Dr. A. COURCOUX—whose monograph on Wounds of the Pleura and Lung appears at a most opportune moment—"On sait aujourd'hui que l'expectation béate est un renoncement et non un mode de traitement."

More than a year ago Major ALEXANDER DON sent us a paper on Gunshot Wounds of the Chest at a Casualty Clearing Station, embodying the results of his practical experience and advocating more active treatment. Major DON was early impressed with the fact that recovery sometimes follows quite severe chest wounds, and drew the legitimate deduction that the chest cavity is not so vulnerable as we had long supposed it to be. Pre-war thoracic surgery had dealt principally with the victims of malignant disease and prolonged empyema, and the experience so gained could not fairly be applied without further inquiry to the soldier in full vigour of body and in possession of admirable recuperative power. Major DON'S valuable contribution was unfortunately lost in transit. In another column of our present issue Captain W. A. REES and Captain GERALD S. HUGHES analyse a series of 140 consecutive cases of wounds of the chest which have come under their notice during a period of six months at an advanced operating centre. During the first few hours after the injury primary hæmorrhage is the chief cause of death, and for the severe cases, blanched and restless, treatment is in the main expectant. In the experience of these observers the blood came for the most part from the vessels of the lung and bleeding was stanched by Nature's method of pulmonary collapse, and in no case did they see severe hæmorrhage from an intercostal vessel, although we believe such an occurrence not to be rare in the experience of others. In every case in which shock passed off, the chest wall was closed within 12 hours of infliction of the wound, but in only a few selected cases was the foreign body sought for and removed. Attention is rightly concentrated by Captain REES and Captain HUGHES upon the essential point of closing the pleural cavity against contamination from without. As Sir BERKELEY MOYNIHAN stated in a paper, read last autumn before the Clinical Congress of Surgeons of North America, in cases of open thorax the earliest and most complete effort must be made to secure closure of the wound.

Turning now to the later treatment of cases in which a missile has been retained within the chest wall, Colonel ELLIOTT, in the article which we have already quoted, gives reasons for thinking that such retention did not cripple the subject for further military service, indicating at the same time the need of more accurate information on the point. In THE LANCET of Nov. 10th Colonel R. D. RUDOLF, C.A.M.C., contributed in this direction a summary of the late results of 50 cases in which X rays showed the presence of a missile lying deep to the ribs. Out of the whole series only two died, in each case after an operation had been performed at a late period for the removal of the foreign body. Twenty-nine were able to return to full duty, while seven others became fit for light military work of one kind or another. Moreover, although the total number of men with retained foreign bodies in the chest must be large, Colonel RUDOLF never met with a case of a second invaliding from this cause. Such men may complain of discomfort, slight cough, or shortness of breath, but the symptoms are not urgent, and may in some cases not unreasonably be attributed to the knowledge that the foreign body is there. The question then presents itself: Is it wise to insist on the removal of a foreign body which has penetrated the chest wall? The answer is different according to the period at which the case is seen. When, in a recent wound, it may be presumed that the foreign body is large and has carried in with it septic material, it should be removed, as the consequent suppuration will be serious and the risk from empyema and septic broncho-pneumonia very great indeed. If, however, the foreign body is small, and its presence is only ascertained on X ray examination at a later stage, and after the thoracic wall has healed, it is unwise to insist upon its removal, for if retained it seldom does harm, whereas the operation for its removal may easily be more prejudicial to the patient than its retention.

[1] THE LANCET, 1917, ii., 371.

Medical Examination for National Service and for Life Assurance.

THE instructions to the National Service Medical Boards have now been issued and show indication that much thought and consideration have been devoted to their preparation. They will repay careful study by all members of the medical boards constituted for the purpose of examining recruits. The men will be examined in order to grade them according to their physical and mental fitness. The grades which have been authorised are briefly as follows: Grade 1 comprises those men who attain the normal standard of health and strength and are capable of enduring physical exertion suitable to their age. Minor defects, such as of the teeth and of eyesight, do not disqualify. In Grade 2 will be placed those men who, for various causes (e.g., "partial disabilities"), do not reach the standard of Grade 1, but are, nevertheless, physically able to do vigorous work. Men in Grade 3 will be those who from any cause are not suitable to undergo military training as fighting men, but will be fit for any of the auxiliary services connected with the Army, and fit also to continue within the Army the work in which they are already employed or its equivalent. Grade 4 will include all those who are unfit for military service. An epitome has been carefully drawn up suggesting a suitable gradation for some common disabilities and diseases. This should be particularly useful to those examiners who have not had much practical experience with soldiers serving in the ranks. It is pointed out that these statements are not intended to bind chairmen and members of boards to place a man in the suggested grade, for it is rightly recognised that each case must be decided on its merits, but the suggestions will assist, so far as it is possible, in procuring some uniformity in the grading of men throughout the country. We would also draw attention to a fact on which we think sufficient stress has not been laid—namely, that a man with some disability which would render it doubtful whether he should be placed in Grade 1 may be able to undertake vigorous employment in civil life, because he can stop when he wishes in order to rest; whereas, as a soldier, he has to proceed straight on with his comrades, and is unable to cease from the work in hand. Taking the instructions altogether, we are of opinion that they are fair and sound, and are likely to prevent hardships on individuals.

The examination of recruits has been frequently compared to examination for life assurance. There are some resemblances and some differences. Life assurance ultimately resolves itself into a commercial transaction, and the medical examination is to protect the societies by preventing undesirable risks from being accepted. The calculations are based upon averages, and the tables for the various forms of assurance are framed accordingly. The main object of the medical examination is to assist in the formation of an opinion as to whether an applicant for assurance will live long enough to become a profit to the society; or, in other words, the society has to make arrangements which will not come into force until a certain number of years have elapsed. On the other hand, in the examination of recruits it is only the next reasonable period, visualised in months, which has to be considered. In life assurance, as a healthy individual, accidents left aside, is likely to live longer than one who has an organic defect, so in the recruit, a sound man in every particular will make a better soldier than one who is not sound, but the period over which he is expected to stand great physical strain is limited, though continuous. However, the instructions now recommended to the medical boards are similar to those given to examiners for life assurance, and if the regulations given out by the Minister of National Service are properly followed it will probably be found that men placed in Grade 1 are all "first-class lives" from an insurance point of view. The details on family history and records of past illnesses have to be given in more particularity in the life assurance medical reports, but well-directed questions by the medical boards to each recruit should yield practically the same results. The medical examination of the recruit is more thorough in some ways, in that the physical development of the man is more closely criticised than is that of the applicant for life assurance: marked flat-foot, hammer-toes, or knock-knee would not affect the risk for life assurance, whereas with the recruit a man with such defect would be placed in Grade 3. On the other hand, the results of examination of the urine, on which much stress is necessarily laid in life assurance, are not so strictly interpreted with the recruit, while his vision tests are more elaborate, being part of the marked difference in dealing with organic defects.

One medical example may be given to illustrate certain of the points raised. A man with a well-compensated mitral regurgitant murmur is examined as a recruit. Certain exercise tests are performed to ascertain the amount of his heart reserve power; if these prove satisfactory he may be placed in Grade 2. The same conditions may exist in a man who presents himself for life assurance; but here another important question arises. What will be the condition of the man's heart in 15 or 20 years' time? The form of policy, of course, will have to be decided upon, and in this way the problem is complicated, but to decide as to whether such a man is suitable for immediate military service is more momentous. The soldier is not a free agent; he cannot husband his resources or bank up his reserves. If this is borne in mind always, the regulations issued by the Minister of National Service should prove equally successful as the medical examination for life assurance. And this is saying a good deal. If this procedure had not been found of value it would have been discontinued, whereas the various insurance societies seek to obtain the best medical advice possible, and the mortality returns demonstrate the satisfactory results. We believe it will be so with the new recruiting boards, for we feel sure that the members of those boards will do their utmost both for their country and for the men.

Annotations.

"Ne quid nimis."

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND: A SECOND APPEAL.

IT was announced at the end of last year in the medical and pharmaceutical press that a second appeal in behalf of the Belgian Doctors' and Pharmacists' Relief Fund would be made, and we are glad to see from a short list of subscriptions published in our columns to-day that the movement is already meeting with some support, although there has been no opportunity as yet to advertise widely the bitter and immediate need for money. At the last meeting of the Executive Committee of the Fund the position was revealed clearly that without further large and prompt subscriptions it would be impossible to keep up the monthly payments to Belgium, on which the families of the doctors and pharmacists in that country have been partly relying in their condition, as described by one of themselves, of "mere suffering, no liberty, no food." The money at present in the hands of Dr. H. A. Des Vœux, the honorary treasurer, will allow of the sending of the usual, or nearly the usual, subsidy in January and in February; the Fund will then be exhausted, and at a time when the need for its assistance is at the highest point for these poor people—our colleagues. Our readers are referred to the pages of the *British Medical Journal* and of THE LANCET for the detailed financial statement showing the position of the Fund; from this the urgency of the matter can be gathered. We trust that the appeal of the Executive Committee for renewed support will meet with good and quick response. The first appeal for the Fund brought in £5000 at the end of the third month, and £18,000 at the end of the first year, with the result that a total of £20,000 was reached at the end of the second year—i.e., in November, 1916. No appeal after the first one was ever issued, and the expenses of administration have been £62 only, owing to the fact that all the service has been rendered gratuitously. A movement supported so spontaneously and a fund expended so economically deserve to be kept in existence as long as the work remains unfinished; and with complete knowledge of the personal sacrifices which most of our professional brethren are enduring, we beg them to repeat their generosity to the Belgian Doctors' and Pharmacists' Relief Fund.

DYSENTERY IN THE BRITISH SALONIKA FORCE.

WE publish in this week's issue of THE LANCET a paper by Major Duncan Graham, C.A.M.C., recording some observations upon the diagnosis and treatment of the cases of dysentery occurring in the troops in the British Salonika Force. Major Graham summarises his results in a series of seven general conclusions given at the end of his paper. These are somewhat tersely and dogmatically expressed and should be taken as concise expressions of the author's opinions rather than as conclusive generalisations upon the disease in question. We understand that further papers discussing some of these points more in detail may be expected; meanwhile, we commend Major Graham's paper as a valuable contribution to the study of dysentery, and emphasise the practical nature of the hints he gives as to diagnosis and treatment. On the basis of the examination of 2500 cases of dysentery or diarrhœa he finds that 95 per cent. of the cases of dysentery occurring in the British Salonika Force are of the bacillary type. He describes the macroscopic and microscopic appearances of the stools in severe, moderately severe, mild, and recurrent cases of bacillary dysentery, and states that in the "blood and mucus" stage these features are sufficiently characteristic to enable a diagnosis of "clinical bacillary dysentery" to be made, but he admits that the stools in acute amœbic dysentery are not so characteristic and that in mixed infections laboratory examination is essential. He maintains, however, that all cases passing stools containing clear, transparent, or white mucus, flecked or streaked with bright-red blood, should be treated as bacillary dysentery. He describes a mild form of bacillary dysentery, under the name of "mild recurrent bacillary dysentery," which he claims is the cause of a very fair percentage of the cases admitted to hospital as simple diarrhœa. Agglutination tests in 100 of these cases indicated that they were due to infection with dysentery bacilli of the Flexner-Y group. Major Graham is of opinion that there is no evidence that intestinal flagellates can produce a disease of dysenteric type, and thinks that more proof is necessary even to regard them as causing simple diarrhœa. Major Graham's suggestions in regard to treatment and diet are thoroughly practical and worth careful consideration. In severe cases he has obtained the best results from the intravenous injection of from 60 to 80 c.cm. of anti-dysenteric serum once or twice daily for three days, using that obtained from the Lister Institute. This is followed by injections of 150 to 300 c.cm. of normal saline daily for the first two days and once daily for the next two. In very toxic cases 5 per cent. glucose in distilled water should be used instead of the saline. He emphasises the great value of this method of treatment in preventing dehydration of the tissues. In the mild cases he thinks that neither saline nor serum is necessary.

THE MEDICAL ASPECTS OF AVIATION.

WE trust that the newly constituted Air Council, whose president will be a Secretary of State of the first rank, will give every possible attention to the medical aspects of their duties. It is known that there has been a well-supported movement for constituting an air medical department as a new and separate service, so that, by starting from the beginning, while full advantage could be taken of the examples of organisation afforded by the Naval and the Army medical services, the defects in those services which experience has revealed could be avoided. We have reason to believe that the creation of an air medical service of this new and independent sort has not met with the approval of the Air Council, whose decision on the matter may, however, yet be in reserve; but we are certain that the arguments which gave origin to this movement must have due effect with the well-chosen personnel of the Council, among whom, by the way, room should be found for the director of the medical branch of the work. Our number of aviators, already large, is bound to be greatly increased, and there is not a medical man, whether with or without special knowledge, who cannot see that the strain on these young men must be enormous, and that to allow unfit persons to take the responsibility of flying.

air-scouting, and air-fighting may be to condone suicide. Questions of blood pressure, of cardiac affections, of muscular balance, and of nervous stability are alike involved, and the flyer should not only be selected from the beginning for his sound physiological and psychological make-up, but he should be submitted to regular scrutiny during the whole time that he continues to discharge his arduous functions. In particular should the cases of those flyers who have had accidents be made the subject of careful investigation by medical officers qualified for the task, and the qualifications are not possessed by all. These officers will have to judge of their charges in highly difficult circumstances and decide about the possibility of the return to duty of each man as a flyer. Secondly, they will have to investigate the causation of injuries in order that accidents may as quickly as possible be grouped according to their similarity in occurrence or in other points, for in this way the existence of some common physical default, which has led to a group of accidents, may be detected in other aviators, and this before new tragedies have occurred from an old cause. Some such responsibilities as these will devolve upon the air medical service, and in whatever shape it comes into existence we hope that these considerations will have due weight, that the proper men will be chosen for the work, and that no matter of rank, save of intellectual rank, will have anything to say to the highly scientific questions that will be involved. Reference is made in another column of this issue of THE LANCET to the experiences of Major R. N. Greene, of the American Army Medical Service, in regard to aviation. This officer found that blood pressure was raised at 10,000 feet from 120 to 200 mm., and suggests that flying may eventually cause arteriosclerosis and cardiac hypertrophy. He ascribes some fatal falls to fits of unconsciousness, and urges that medical examination in doubtful cases of physical fitness should be controlled by giving the candidate an opportunity to fly as a passenger, the mental equipment of the aviator being almost as important as the physical, so many and confusing are his problems, so rapidly and so appropriately must he meet them. Major Greene exactly shows the need for a specialised medical service such as we are advocating.

METROPOLITAN POLICE FORCE.

THE report of the Commissioner of Police of the Metropolis (Sir E. R. Henry, G.C.V.O., K.C.B., C.S.I.) for the year 1916 has been presented to Parliament. It states, *inter alia*, that the Orders made by the Central Control Board (Liquor Traffic) restricting the hours and conditions for the sale, supply, and consumption of intoxicating liquor in licensed premises and clubs have been in existence for a complete year and have been productive of excellent results, which are borne out by the striking decrease in the number of proceedings for drunkenness, drunken and disorderly conduct, assaults, and minor forms of disorder. The actual number of charges for drunkenness dealt with by the courts is less than the most sanguine could have anticipated.

The number of accidents caused by vehicles in the streets during 1916 by which persons were killed was 833, as compared with 851 in 1915 and 639 in 1914. The number of accidents caused by vehicles in the streets during 1916 by which persons were injured was 22,091, as compared with 25,867 in 1915 and 25,470 in 1914. During the year 10,793 persons suffering from accidents and 4828 suffering from other causes were taken to hospitals by police. The Motor Ambulance Service inaugurated by the London County Council in 1915 for the speedy conveyance to hospital of persons suffering from injury or illness in streets situated within the County of London has proved to be of great value both to the sufferers and police. The ambulance is summoned by police from the nearest available postal telephone, also from certain buildings where plates inscribed with the letter "A" have been affixed denoting that the telephone installed therein may be used. In cases in which the person to be conveyed is so seriously ill or injured as to be unable to give name and address, police accompany the person to the hospital and endeavour to establish identity and inform relatives or friends. The number of police injured whilst on duty during the year was 2216, of whom 583 had to be placed on the sick list for 7 days or over, 158 for less than 7 days. The following analysis of the causes of their injuries is interesting as indicative of the risks of the policeman's calling: Assaulted by prisoners, 935; assaulted by persons who were not apprehended, 20; when dispersing disorderly crowds, 13; by horses falling, 23; thrown from horses, 19; by stopping runaway horses, 57; assisting with fallen or restive horses, 12; by vehicles when regulating traffic, 27; bitten by dogs, 62; when assisting at or extinguishing fires, 29; by falling down or slipping in the streets or when examining premises, 526; kicked by horses, 21; trodden upon by horses, 9; while riding bicycles, 180; by bicycles ridden by other persons, 3; testing or driving motor vehicles or boats, 26; by objects falling, 25; by foreign object entering eye, 11; at fire-drill, 3; colliding with objects, 89; other causes, 106.

The average daily number of men on the sick list in 1916 was 495·59, on sick leave 36·38, and on detached leave 52·42—total, 584·39. The mean actual strength of all ranks was 18,570, so that the daily average loss on the whole force by sickness showed a percentage of 3·15, as against 2·96 in 1915.

ALCOHOLISM AMONG WOMEN.

THE number of women now in industrial life and in non-sheltered occupations common to men is estimated at the present time to exceed by nearly a million and a half the number so employed before the war. Increase in number has been accompanied by a considerable rise in average wage, and experience in the past has shown that excessive drinking, whether by men or by women, varies directly with purchasing power. Our satisfaction is, therefore, the greater to learn from the chairman of the Liquor Control Board, in his recent lecture at the Royal Institute of Public Health, that during the last two years while the movement of female industrial employment has tended upwards the movement of female convictions for drunkenness has tended downwards, thus confirming Sir E. R. Henry's figures the substance of which we have quoted in the previous annotation. The two movements are not essentially correlated and the vicious circle uniting them has apparently been broken. Lord d'Abernon classified under three headings the main causes producing this desirable result: (1) the restrictive measures applied to the sale of alcohol; (2) the constructive measures adopted to increase all opportunities for non-alcoholic refreshment; and (3) the limitation on the output of alcoholic liquors imposed by the Food Controller. The Women's Advisory Committee of the Board had called attention to the danger of the system of payment on delivery, with its accompaniment of canvassing for liquor orders from door to door, and to its prohibition Lord d'Abernon attributes a specially salutary effect, as well as to the provision of canteens providing well-cooked and well-served meals for 300,000 women operatives. Health officers and other social workers agree in noting the improvement in the comfort of the home and in the care of the children which has run parallel with the reduction of drinking. Lord d'Abernon finds, too, that restriction and regulation on reasonable

lines have been beneficial to the liquor trade interests, and concludes that there is no responsible body of opinion desirous of returning in this respect to pre-war conditions.

ENDOCRINOLOGY.

THE literature of internal secretion is already extensive. Biedl's compendious work sets forth the standpoints of physiology and experimental pathology, and Falta's more clinical text-book was introduced to English readers by Sir Archibald Garrod. Professor Pende, of Palermo, has now covered the whole ground in a single volume,[1] in which the morphological, pathological, and clinical aspects are developed and arranged so as to be of service alike to the physician and the scientific investigator. The author's main theme may be briefly summarised as follows:—

The fundamental physiological principle maintained by the author is that the function of the endocrine glands is not that of neutralising hypothetical poisons circulating in the blood, but of stimulating the anabolic and catabolic processes in the various tissues, thus regulating tissue change, growth, and the tone of the nervous system. Each gland must be considered as secreting not one but several hormones, the function of each of which differs specifically from that of the others. Hence it cannot be admitted that some glands can, in certain pathological conditions, take the place of others, but rather that the action of each hormone is coördinated with that of the others. Some hormones are functionally synergetic and others antagonistic, and there is hence a physiological interhormonic equilibrium maintained by these relations which act either through chemical or nervous mechanism. On this interhormonic equilibrium depends, in different periods of life, the equilibrium of organic and nervous metabolism. The author, however, attributes the functional condition of the endocrine system, conceived as a trophic regulatory apparatus, to individual constitution and temperament, and divides all hormones into two principal functional classes, one of which regulates the morphogenesis of vegetative life, the anabolic processes of tissue change, and the excitability of the autonomous nerves; the other, the morphogenesis of animal life, the catabolic processes and excitability of the sympathetic system. These two categories vary in the different periods of growth, so that their equilibrium is unstable and undergoes oscillations in the various individual evolutive and involutive crises. Professor Pende disagrees with the Vienna school, which divides the glands themselves into these functional groups, because hormones functionally different may be developed in the same gland. Probably the interhormonic equilibrium varies in the two sexes, different races, climates, and seasons. Neither does the author share the opinion of the Vienna school that the synergetic glands are mutually excitant and the antagonist mutually inhibitory, for the reciprocal aid which two hormones may render must not be confounded with the stimulant action which one might exercise on the secretion of the other; nor must the functional antagonism between two hormones be confused with the inhibitory action which one may exert over the secretion of the other. As to the mechanism of the action of hormones on the tissues, the author thinks that in normal circumstances it is neuro-chemical and believes that the endocrine apparatus is physiologically inseparable from the sympathetic nervous system. From these fundamental conceptions certain pathological conceptions follow. The pathological anatomy and the clinical aspect of the internal secretions do not go *pari passu*; grave anatomical lesions may exist without clinical evidence, while slight lesions may cause severe symptoms. All depends on the degree of functionality in the gland and not on the amount of altered tissue. From a nosological point of view the author divides the endocrine syndromata into monoglandular and pluriglandular; in the former it is possible to distinguish symptoms of focal origin and collateral symptoms of interglandular reaction. But the presence of these latter does not warrant the clinical conception that all endocrine syndromata are pluriglandular. Professor Pende distinguishes the following types: monoglandular syndromata; pluriglandular with clinical predominance of a known monoglandular syndrome; pluriglandular associated with several monoglandular syndromata; attenuated pluriglandular of indefinite clinical type; and endo-exocrine pluriglandular from association of diseases of the two kinds of glands. The general therapeutic conception of the author is that an opotherapeutic preparation acts not by substituting but by stimulating or regulating the function of the diseased gland, and if this should be incapable of responding owing to its destruction the effect will be illusory. Opotherapy is not always *specific*—that is, it may act by stimulating other glands besides that to which the preparation belongs, and the results of administration have no definite diagnostic value. The work contains numerous personal researches of the author in the morphology and pathology of all the endocrine glands and original contributions to the study of acromegaly, myxœdema, Basedow's and Addison's disease, diabetes, and infantilism, and also investigations into hormonic anomalies of morbid diatheses, and certain conditions termed by him endocrino-sympathetic syndromata, of combined glandular and sympathetic origin, such as Dercum's disease and trophoangioneurosis.

Professor Pende also gives a chapter on endocrine semeiology, synoptic tables of symptoms for the use of the practical physician, and a large collection of coloured plates of the normal and pathological histology of the endocrine organs, drawn from original microscopic preparations. An index of more than 3000 names of observers, of which 600 are Italian, gives some idea of the author's erudition which won for him the Guido Baccelli gold medal. He has done much to place endocrinology on a scientific footing.

[1] Endocrinologia, Patologia e Clinica degli Organi a Secrezione Interna (con 25 tavole a colori e 152 figure nel testo). By Professor N. Pende, University of Palermo. Casa Editrice Vallardi, Milan. 1916 Pp. 1034. Price 35 lire.

THE POTASH SHORTAGE.

THE shortage of potash salts is felt in medical circles as well as in many important industries, and it is good to learn that before long ample supplies will in all likelihood be produced in this country from British sources. When once the problem of economic extraction is solved we may look for a normal output of potassium salts. This country possesses a wealth of felspar which, in the form known as orthoclase, is a mixed silicate of alumina and potash. Felspar occurs, amongst other things, in granite, and often in veins in a more or less pure state. There is a big distribution of this material in the north-west of Scotland, in Ireland, and in Cornwall. Orthoclase contains about 12 per cent. of available potash, and, incidentally, the alumina should prove a valuable by-product. We understand that considerable attention is being given to the question of a remunerative working of this material, and that so far the results are full of promise and may render us independent once and for all of the supplies of potash hitherto almost exclusively obtained from the remarkable deposits at Stassfurt in Prussian Saxony. The matter certainly seems to merit the attention that is being given to it when we consider the many valuable applications of potash in the industrial world. It is the basis of fertilisers for the plant; it forms the well-known soft soap, with specific detergent qualities for scouring certain fabrics, although soft soda soaps are a recent introduction; it is essential in glass-making and a vital constituent of certain pottery wares. The importance of potash salts in medicine is well recognised, but is due rather to the acid group to which it is attached. In regard to iodide the point of the relative value of the potash and soda salts is raised by Dr. E. W. Adams in our correspondence columns. A curious source of potash is the flues of cement kilns and blast furnaces, and by increasing the amount of potash-felspar in the cement the deposit in the flues would be proportionally increased and the potash in it worth recovering. Amongst the new industries to be founded in this country that of extracting potash from our own abundant mineral deposits will not be the least important.

WAR-TIME ORTHOPÆDIC SURGERY.

WE publish in another column a full abstract of Sir Robert Jones's address on war-time orthopædic surgery delivered at the Hunterian Society on Jan. 2nd, and our readers will welcome the precise statement of many of the conclusions to which he has come in regard to the vastly important injuries involving impairments of locomotor function. These impairments, which include something like one-half of the grand total of war injuries, form an economic problem of great urgency and magnitude. Sir Robert Jones contrasted preventive with corrective orthopædics. The former is the task of every surgeon in the field, and, in so far as it meets with success, it limits the necessity for the corrective practice of the trained orthopædic surgeon, part of whose work is the deliberate infliction of the original injury and the treatment of the case over again. He paid a tribute to the work of the surgeons in France, who, he said, had shown greater initiative and had made more progress than we had done at home. But gunshot wounds of the femur remain one of the great tragedies of the war, both by reason of the mortality from shock and the frequent deformity and shortening, and the lecturer rightly devoted an important section of his address to an analysis of the causes of failure and the means desirable to effect a drastic improvement. Efficient fixation and continuity of treatment should be the two guiding principles in fractured femur, to be put into practice by what Sir Robert Jones called efficient "team work," including the trained nurse and orderly, as well as the surgeon; and the patient should not be lost sight of at any stage of his *via dolorosa* from the regimental aid-post until the War Office finds him fit again for service or hands him over to the Ministry of Pensions to be made a self-supporting and independent citizen. Many of the suggestions outlined in the address have, we understand, already been adopted at the front, and there are few more striking object-lessons of the war than the orthopædic team work, in organising which Sir Robert Jones has had so large a share.

NEW DEPUTY DIRECTOR-GENERAL, A.M.S.

THE appointment is announced of Colonel T. H. J. C. Goodwin, C.M.G., D.S.O., as Deputy Director-General of the Army Medical Service on the retirement of Surgeon-General Sir M. W. Russell, K.C.M.G., C.B. Colonel Goodwin received his commission in 1893, and four years later acted as staff-surgeon in military operations on the North-West Frontier of India, when his good services earned him mention in despatches and the D.S.O. During the present war he has been recognised both in despatches and by decoration and promotion as a member of the Royal Army Medical Corps, with high administrative qualities.

Sir John Collie has been appointed Director of Medical Services for the Ministry of Pensions.

Captain H. L. Martyn, R.A.M.C., has been appointed one of the Surgeons-Apothecary to His Majesty's household at Windsor.

Dr. William Laidlaw Purves, whose death occurred on Sunday last, at the age of 75 years, was consulting aural surgeon to Guy's Hospital.

JOHN COAKLEY LETTSOM AND THE FOUNDATION OF THE MEDICAL SOCIETY.[1]

BY SIR STCLAIR THOMSON, M.D. LOND., F.R.C.P. LOND., F.R.C.S. ENG.,

PRESIDENT OF THE SOCIETY; PROFESSOR OF LARYNGOLOGY IN KING'S COLLEGE HOSPITAL; SURGEON FOR DISEASES OF THE THROAT AND EAR IN KING GEORGE'S HOSPITAL; LARYNGOLOGIST TO KING EDWARD VII. SANATORIUM, MIDHURST.

John Coakley Lettsom was one of a twin, and was born in 1744 and died in 1815. The following sketch of his career may be more interesting if we recollect that he had no great social or family influence, that he never attended any noted school or had a regular university course, that he was not a Fellow of the College of Physicians, that he never held any Court appointment, and was not on the staff of any well-known London hospital. He may have had his good turns of fortune, but he had few advantages in his birth, education, and upbringing, and the success of his evidently healthful, happy, vigorous, and useful career was due almost entirely to his own application, his keenness in his profession, his love of humanity, the breadth of his interests, his zest for life, and his happy disposition.

Lettsom's Early Life.

He was born in the West Indies and may have had some native blood in his veins, for he refers in a letter to the suggestion, without denying it, that he had the "volatility of the Creole with the plodding industry of the German." He had no sister, and as he was sent to England at the early age of 6 we cannot claim much home influence in forming his character. He never saw his father again. He was sent to a small school of 40 or 60 boys at Penketh, in Lancashire, kept by a member of the Society of Friends, for he belonged to a Quaker family, and he lies buried in the Friends' Burial Ground, Little Coleman-street, Bunhill-row. While at this school he came under the influence of the well-known Quaker minister, Samuel Fothergill, of Warrington, the younger brother of the celebrated Dr. John Fothergill, of London, and from this more or less accidental acquaintance we can trace an influence on the career of Lettsom and the origin of our own Fothergillian gold medal. At this small day-school Lettsom only remained until the age of 14, and during this time, if he learned little Latin and less Greek, he had the much greater advantage of acquiring a knowledge and love of nature by being allowed and encouraged to join in the usual country sports of school-boys of a former generation. Following the hounds on foot, sometimes assisted by pole-jumping, bathing and swimming, the use of bow and arrow, fishing, sliding, and long days spent in nutting or bird-nesting, not only helped to form a vigorous and active constitution, but gave a keenness in observation, a resourcefulness in emergencies, a quickness of eye, and a love of fellowship with nature, which the present generation runs the risk of losing with its exaggeration of formal games confined within monotonous playing grounds.

Lettsom's education finished in his fourteenth year. His father was dead, and his mother in the far West Indies had married again. He was then sent to Liverpool for a business training, but at the end of a year circumstances arose which resulted in his being apprenticed as a pupil to Abraham Sutcliff, a surgeon and apothecary at Settle, in Yorkshire. If the school in Lancashire helped in the promotion of Lettsom's physical vigour and powers of observation, it is to his five years' residence in Yorkshire that we may ascribe the opportunity for the acquisition of a love of learning, much book lore, habits of work, training of memory, and the faculty of managing patients. His master, Sutcliff, was an excellent classical scholar, though quite self-taught, and under his guidance he made such progress in Latin that he was able to study in that language the works of Boerhaave, Winslow, and others. We should remember that in the eighteenth century Latin was still a living language, for Lettsom, like all physicians of the time, could follow lectures in it at foreign universities, discuss medical matters with colleagues of various countries in Latin and, by its medium, submit himself for a diploma

[1] A Presidential address delivered before the Medical Society of London in October, 1917.

at Leyden. He records that he "attended the lectures of Innes, Sinclair, Plummer, and Rutherford in that language (i.e., Latin), in which I was pretty well qualified to maintain a conversation or dispute." With a party of friends he shared the expense of procuring a French master from London, so that he not only could read the language with ease, but could speak and write it fairly well. This must have been a vastly superior education to the fragmentary knowledge of disjointed grammar of mispronounced Latin, which nowadays takes up so many years of an English boy's life and results in such appalling ignorance both of it and of his own tongue.

Medical Career: Early Success.

At the end of his five years in Settle, and at the age of 22, Lettsom, in 1766, started for London, where he was without a relation and did not know a friend. His subsequent career is so well epitomised in a letter he wrote 25 years later that I cannot do better than transcribe it:—

London, December 31st, 1791.

Medicine is rather a practical than a brilliant art and depends upon study as much as genius. Poverty led me to physic. I was placed with a country apothecary, whose fee was moderate. I had no particular predilection for medicine. I never possessed genius; my memory was bad; I made dictionaries and tables of my own invention; to assist memory. I formed indexes of what I read, and by industry acquired something. I came to London, and saw Dr. (John) Fothergill, my ambition was inflamed, and I dared to say, London shall be my theatre; but having no more money than to carry me through the hospitals I could not attend many lectures, and upon this depended my improvement; for instead of hearing and learning of lectures, I was compelled to learn at the bed of sickness. Here I saw nature and learnt my art without the leading-strings of professors. I acquired an early habit of behaving with kindness to the sick, and having known want, I knew how to sympathise with distress. After two years in an hospital I went to the West Indies to get assistance to bring me upon the theatre I now act. Six months abroad enabled me to visit London, Edinburgh, and Leyden, and ultimately to sit down in the first city; and I know not why any other person, with £500, may not do the same.

Yours respectfully,
J. C. LETTSOM.

This is a good letter with a brave ring in it, revealing much of our Founder's character both by what it states, and also by what it omits. Lettsom does not mention in this letter that though he returned for the first and only time in his life, to his native island to get assistance, his first action on arrival in the West Indies was to free the 50 slaves he had inherited. Apart from these slaves, and a small portion of land he was not possessed of £50 in the world.

The "assistance" which he went to seek on the Island of Tortola he himself created by starting practice there at the age of 23, and in the short space of five months he amassed the surprising sum of £2000. He must surely have had a keen sense of the business side of his profession if at this age, as a first start, and in an insignificant West Indian Island, he could earn from his profession at the rate of £4800 per annum. His income later on was equally astonishing. His biographer states that by the age of 40 he had acquired, and for a considerable time maintained, the first practice as a physician in the City of London. It appears that in 1783 (at the age of 39) he received £3600. From 1786 to 1800 (aged 42 to 56) his fees increased greatly, amounting to not less than between £5000 and £12 000 annually. When we remember Lettsom's lack of professional prestige, his comparative youth, his distinguished contemporaries, and the much greater purchasing power of money 125 years ago, this goodly income—so far as my experience goes—is a higher pecuniary reward than the physician of the present day can hope for. But, if he made a good income, it was only earned by hard and incessant work. Thus, of this £2000 he earned by practice at Tortola he gave half to his mother, and, with the remaining £1000, he determined to return to England. After a *Wanderjahr* spent at Edinburgh, Paris, and elsewhere, he took his Degree of Doctor of Medicine at Leyden on June 20th, 1769, with a thesis entitled "Observationes ad vires Theæ pertinentes," and commenced practice in London under the protection of Dr. John Fothergill. If Lettsom earned much money he also spent it generously; in a letter written in his thirty-ninth year he writes that "with an income of £5000 a year I am always involved." This need not surprise us when we read that between the first day of January and the third week in February his donations one year amounted to £600. Besides this munificence in charity, his hospitality must have involved him in lavish expenditure. He writes that "with one domestic or another I have about 22 in family." This was doubtless between his house in Sambrook-court, Basinghall-street, and the considerable mansion which he calls "my rural villa about four miles from town." This was Grove-hill, at Camberwell, where he had five acres of garden, 200 fruit trees, a botanical garden, a large museum, a library of 12,000 volumes, an apiary of 64 hives, walks, lawns, fountains, ponds, groups of statuary and an avenue called "Shakespeare's Walk," with what Pettigrew calls "an uncommonly fine statue of our immortal dramatist" in a summer-house at the end of it. Here he was in the habit of receiving visits from celebrated foreigners, and men of learning and taste. No less a character than Dr Johnson's biographer, the immortal Boswell, was a frequent visitor there and refers to these Camberwell parties in some verses from which I quote the following:—

"Yet are we gay in ev'ry way,
Not minding where the joke lie:
On Saturday at bowls we ply
At Camberwell with COAKLEY.

Methinks you laugh to hear but half
The name of Dr. LETTSOM:
From him of good,—talk, liquors, food,—
His guests will always get some.

In fossils he is deep we see,
Nor knows Beasts, Fishes, Birds ill:
With plants not few, some from Pelew,
And wondrous *Mungel Wurzel!*

Wet India bred, warm heart, cool head,
The City's first Physician
By schemes *humane*,—Want, Sickness, Pain,
To aid is his ambition."

Fullness of Lettsom's Life; Hard Work; Holidays.

As I have said, Lettsom's good income, which he spent so generously, was earned by constant hard work. As early as the age of 23 he records that he seldom prescribed for fewer than 50, and often twice as many, patients before breakfast. When he was 38 he writes that, "sometimes for the space of a week, I cannot command 20 minutes' leisure in my own house." A year later he writes, "since 1769 when I first settled in London I have not taken one half day's relaxation, and I cannot get to Grove Hill above once a fortnight." In 1791 (he was then aged 47), he observes, "during the last 19 years not one holiday have I taken, and this will probably be the last of my life, unless sickness compels me to seek leisure." The "holiday" here referred to consisted in travelling by coach to Margate, spending two hours on important business there, and returning the same day, 144 miles in the day and night. In another letter he records that his practice "had not suffered him to sleep in his own bed for 13 following nights," and he evidently spent much, not only of his days but of his nights, in his travelling coach, for one correspondent reproached him for "converting his carriage into a dormitory and a suttling-booth." His carriage served him for still another purpose; he was a voluminous writer, and yet nearly all his letter-writing was done in his carriage. He used up three pairs of horses daily. When we recall the condition of the roads in the eighteenth century, the pace at which his coach must sometimes have travelled, and the non-invention of stylographic pens, it is astonishing to glance at the number, length, and completeness of the letters which have been preserved, and to read, when he was 60 years of age, that "my professional duties incessantly occupy me, and compel me to write all my essays in my carriage."

Manifold Interests.

If all these strenuous days and nights had been devoted solely to his extensive practice we should not be surprised. But his interests and self-imposed duties were spread over a large variety of subjects, and he rendered important public services as a philanthropist. In 1770 he founded the General Dispensary in Aldersgate-street (the first of its kind in London); he established the Sea-Bathing Infirmary at Margate; he was one of the founders of our own society; he was an active member and a lecturer of the Philosophical Society; he was one of the founders of the Royal Humane Society; he was a friend and supporter of Edward Jenner and an active supporter of the recently introduced vaccination for small-pox; the reform of prisons was responsible for his friendship and admiration for John Howard, and the amelioration of the condition of the poor and helpless was his constant care. He was the first man to introduce into England the mangel wurzel, as is jestingly referred to in the verses I have quoted, and he always kept up his interest in botany, agriculture, and fossils. He wrote a book called the

"Naturalist's Companion," which ran through three editions. He pointed out the use of birds—even crows—and of moles in Nature's economy, and pleaded for their preservation. He anticipated our cult of the open window and the researches of Leonard Hill when he wrote his "Essay on the Effects of Heated and Stagnant Air."

Soup-kitchens met with his entire approval; the manner of preparing the various kinds of soups is minutely noted in his pamphlet, and the best receipts are given for various articles of diet. Alas, that, after some 125 years, our soups should still be execrable and our cuisine a by-word amongst the nations! In 1798 he published a tract entitled "Hints Respecting the Effects of Hard Drinking." In 1795 he wrote a tract on "Hints Respecting the Chlorosis of Boarding Schools," with advice as to games, diet, clothes, cleanliness, &c. He was greatly interested in the history of medicine. The *Kadaververwertungsanstalt* in Germany, about which there has recently been some commotion in our press, would appear, from a letter of Lettsom's, to have been anticipated by 124 years. In 1793 he writes: "A friend of mine has lately discovered the art of changing human flesh into spermaceti candles. This is not a fable. He means to light up the large room of the Royal Society with the leg of a man. I advised him to go to the swamps of Dunkirk, where he might find materials sufficient to supersede all the tallow of Russia. If this project succeed we shall refine on the custom of the ancients in burning their dead. We may burn our friends over a supper or a pipe. This scheme may puzzle the Materialists about collecting the remains against the last day. My friend has promised me some human candles, but my wife will not suffer them to be burnt." He begins this same letter by saying, "My son is just returned from Göttingen, after nearly a two years' absence," but there is no indication whether the friend who had invented this new sort of human spermaceti candle was a Bosche or a Briton!

In 1801 he published three octavo volumes of collected essays under the title of "Hints Designed to Promote Beneficence, Temperance, and Medical Science."

Substitutes for Wheaten Bread in War Time in 1800.

Amongst his manifold interests the important matter of bread-supply—including the social, economic, and national sides of the question—did not escape Lettsom's attention. One gathers from his writings that the price of the quartern loaf in 1774 was 8*d.*, but by 1800 we find him writing: "At present our quartern loaf is 1*s.* 6*d.*, a sum truly oppressive to the poor." With our present day quartern loaf at only 9*d.*, after three years of world war, our population may take courage by seeing what our forefathers had to endure in the Napoleonic struggles. In 1774 Lettsom, amongst his numerous essays, printed one entitled, "Hints respecting a Substitute for Wheat Bread," and this he republished in 1801 in the third volume of his "Hints and Essays." The substitute he warmly recommends is the fine flour of Indian corn, to be mixed with that of wheat in equal proportion. He adds that, "if rightly managed, the colour will be about the same as the standard wheaten bread, and about 2*d.* in the quartern loaf cheaper than the fine wheaten, when that may be at 8*d.* per quartern." After insisting on the great nutritive value and the agreeable sweet flavour of maize, he writes: "Some, indeed, do not so easily reconcile themselves to it, which often arises from the mismanagement of grinding the corn or baking the bread." The bakers, he directs, have not acquired the best method of mixing and preparing it with wheat-flour, and as to the grinding, he advises that the mill-stones should first be set so wide as but just to burst the thick or farinaceous part of the grain, which should then be passed through a sieve, so as to separate the part of the interior edge of the grain, composed of a ligneous spongy substance, the middle of which is of a dark brown colour and of a bitter taste, which, if ground into the flour, gives it a disagreeable flavour. When this deleterious part has been separated on the sieve, the remainder should be ground with the stones set so as to render it sufficiently fine. "By this precaution," he adds, "the flour is as white as that of the finest wheat, and full as pleasant to eat; it possesses the peculiar quality of preserving the bread, made from a mixture of it, in a moist state for many days, which, at least in dry weather, is no inconsiderable advantage." He expatiates on the way in which the adoption of this "substitute" would release our agricultural lands for other important cultivation. Lettsom also suggested the use of potatoes as a partial substitute for bread, and recommends the use of one-fourth of potatoes with the remainder of flour, as comprising the most pleasant and wholesome bread that can be taken. He points out that if a little ground rice is added, the bread is prevented from crumbling, a matter of consequence in a large family.

Association with Celebrated People.

But his large practice and all these multifarious occupations did not exhaust Lettsom's boundless activity. His various interests and his general culture, added to his hospitable and cheerful character, brought him into contact with many of the most celebrated people of his generation—a time when the renaissance of English art and literature was in full flower. Although he was born, brought up, and lived a Quaker, he was—particularly for that period—remarkably free from all religious bigotry. In spite of the tenets of his sect he was gazetted physician to the Camberwell Volunteer Infantry in September, 1803, and although he writes, "as a Quaker I could not adopt a military character," yet, he exclaims, "May I fall by the sword rather than live to see this free country the domain of a Corsican murderer and usurper!" We might commend this generous sentiment of 1805 in a Quaker physician, aged 60, to the conscientious objectors of our own day. Dr. Lettsom, though ready to die by the sword, declined, as a Quaker, to wear one. When referring in a letter to George III. he writes: "The King has always been very kind to me, and admitted me more than once into his presence without a Court dress, which I never could assume, and perhaps I am the only person who ever kissed his hand unpowdered and unsworded." Lettsom's friendships also were untainted by religious narrowness; indeed, he expresses his partiality for the society of the clergy of the English Church, because, as he says, "they are a learned and improved part of the community." So, in regard to the theatre, he writes as follows on Dec. 1st, 1784: "About 14 years ago I went to see Garrick in *King Lear*, and never since have been at any theatre till the present time; it is not quite consistent with our religious system, but I confess I like to see perfection in every species of art, and this wonderful woman, Mrs. Siddons, being a subject of universal admiration, I ventured against ecclesiastical orthodoxy to see her in *Zara*. It is astonishing with what powers of nature and passion she can place herself in the tender movements of the heart. She speaks as if she suffered all the woes she describes; but she speaks most powerfully to the soul when she is silent: her features, her attitudes, give utterance to that language which melts the heart and interests imagination. She is a fine figure; she is just that medium which has softness without grossness and tender expression without languor."

Lettsom was associated with some of the most celebrated men of his time, an age rich in historical personalities. We have seen how he was frequently received by King George III.; he records his impressions of hearing Pitt and Fox speak in the House of Commons; he corresponded with "General Washington, of America," Dr. Rush, of Philadelphia, and with Benjamin Franklin; Sir Charles Linné (Linnæus) wrote to him in Latin; he studied under Dr. Akenside (the author of the "Pleasures of Imagination," whom he found "the most supercilious and unfeeling physician he had hitherto known"); amongst the founders of the Royal Humane Society (1774) he came in contact with Dr. Oliver Goldsmith, Dr. Heberden, and William Fox; he interrogated George Bidder, the remarkable eight-year-old boy who lived in St. Bartholomew Close, who could not write and scarcely read yet made long arithmetical calculations (May 17th, 1815); he came across Joanna Southcott and attended Lady Huntingdon; he met Braham at musical parties, and he dined with Wilkes, Boswell, and Lee the American; he knew the celebrated Lady Hamilton and was very grateful to her for her kindness to his son when visiting Naples; Sir William Hamilton, "loaded with years and honours," visited him at Grove Hill; it is not clear if he ever met Lord Nelson, but the great sailor expressed his "respect and admiration" over several of the letters written by Lettsom; amongst his intimate friends were Edward Jenner, of Berkeley, in Gloucestershire, and Babington, who nearly invented the laryngoscope. Boswell, whose verses I have already quoted, was a frequent visitor at Grove Hill, and Dr. Samuel Johnson must often have called in

there on his way to tea with Mrs. Thrale, at Streatham. Lettsom evidently knew Johnson well, and gives us the following exquisite pen-picture of him (Jan. 13th, 1785): "The late Dr. Johnson was a pious man; attached, I confess, to established system, but it was from principle. In company I neither found him austere nor dogmatical; he was certainly not polite, but he was not rude; he was familiar with suitable company, but his language in conversation was sententious; he was sometimes jocular, but you felt as if you were playing with a lion's paw. When he spoke it was like lightening over a dark cloud."

Lettsom's conviviality is illustrated by his description of his meeting with the renowned Admiral Sir William Sydney Smith (1764–1840) at the house of his friend and patient, Abraham Goldsmid: "At Goldsmid's ball I met a man I had wished much to know, Sir Sydney Smith, so I told him, and he assured me he had a similar *penchant*. We ate a sandwich together, and then hob-a-nob'd our glasses of porter, and at half-past one in the morning I left him dancing with a Jewess." This cheery picture of a Quaker in his sixty-first year, the leading physician in full practice in London, fully bears out his own statement that "my spirits carry me through a succession of employments with facility."

Lettsom's Strenuous Life.

Certainly his constant "succession of employments," his enormous practice by day and by night, his long coach journeys, his multifarious social engagements, his hospitable entertainments, the care of his garden, his voluminous correspondence, and his extensive publications fill one with wonder. When we recollect that this full life was lived without our modern aids to despatch in the way of secretaries and stenographers, telephones and telegrams, railways and motor-cars, one is the more astonished. Evidently the strenuous life was not invented by Theodore Roosevelt, and a physician of the eighteenth century could work as hard to earn neurasthenia and nervous prostration as any hustler of our time. We are not surprised that his friends preached "some repose and some relaxation from that perpetual tension both of mind and body" which goaded him "to persist in such an incessant hurry and whirl." And again, "Let me seriously advise you, my friend, for the sake of your health, to relinquish your nocturnal lucubrations and your convivialities. Go to bed with your wife and family at 11 o'clock and rise every morning as early as Mr. Hales." This jobation respecting "the whirlwind in which I live and move" Lettsom accepted with great good nature, expressed "a decreasing ardour after medical employment and a thirst for rural retreat," determined "on sleeping every night out of town," "quitting night business and long night journeys," and yet, some 14 years later, we find he is "rarely" at Camberwell, but "usually dines there every Sunday with a party of select friends and now and then sleeps there." Although he writes that his "professional duties obliged him to remain a denizen of the metropolis," yet he was able to hob-a-nob at balls at half-past one in the morning and take his week-end rest by a rush to Margate and back in his coach!

The fact is, Lettsom loved his life and revelled in his overwork. "I love my profession," he writes, "medical business is not my plague but my pleasure." Indeed, his life was an illustration of the saying, "Si l'amour de la médecine fait le savant, c'est l'amour du malade qui fait le médecin." He also believed in varied interests and in the virtue of enjoyment.

A study of his career convinces me that Lettsom threw himself into his profession from love of the practice of it, and into his philanthropic works from, as his biographer states, "benevolence and real goodness of heart." Certain it is that he had no need to work so hard for mere money, for when he was only 26 years of age, he married the daughter of a wealthy tinplate worker, resident in Cannon-street, "and by this marriage acquired a very considerable fortune."

Sketch of Lettsom's Personality.

What manner of man was Lettsom, and how did he manage to live this strenuous life until he was over three score years and ten? His colleague and biographer, Thomas Joseph Pettigrew, thus describes his "person and habits": "He was of a tall, delicate, extenuated structure; his face was very strongly furrowed and his skin was of a dark yellow tint. He was remarkably neat in his dress, which was uniformly the same and constructed after the manner (though not with the utmost precision) of the religious society to which he belonged. He was astonishingly active, even until the commencement of his last illness. He usually walked to attend a portion of his patients for two or three hours in the morning, after which he would take his carriage to visit the remainder. He enjoyed a very good state of health, though subject to a cough in the winter months, for which he usually bled and applied a blister, but he never confined himself on this account. His temperate habits conduced to the enjoyment of health. He seldom exceeded taking more than three or four glasses of wine after dinner, which meal he usually ate with a keen appetite. Coffee was his favourite beverage, which, as he was accustomed to sit up frequently during half the night to answer his numerous correspondents and pursue his literary engagements, very much refreshed him. Before going to rest he uniformly bathed his limbs in cold water and in the morning aspersed the whole of his body with the same. To this practice he attributed the excellent state of health he possessed. His conversation was very sprightly and enlivened with a variety of curious anecdotes. So perfectly could he adapt himself to the habits of all kinds of society that he was as fit a companion for the young as for the aged." This description of our Founder's appearance confirms the impressions we receive from the engraving accompanying his biography and the paintings on the walls of this room. The portrait on the west wall is less worthy than the celebrated group on the east wall by Samuel Medley, which shows Lettsom and the original Fellows of the Medical Society. His personality is brought more before us if we remember that he was "unpowdered and unsworded," that he wore a bob wig, and that his reference to himself as "a volatile Creole" may explain his yellow complexion.

Method of Work.

This being Lettsom's personal appearance, what was there in his manner of work to explain all he got through? His biographer gives as the following explanation: "To a naturally good capacity he united the greatest degree of perseverance. This enabled him to surmount various obstacles that in the course of his practice naturally occurred. The want of a good memory obliged him to be methodical, and by great, and it may be said a truly surprising, regularity he so economised his time as to be capable of engaging in the immense variety of occupations alluded to." These notes to help his defective memory are elsewhere referred to as amounting to no less than 40,000. Lettsom, although a keen and independent observer, a ready writer, and a frequenter of our Medical Society, never made any striking contribution to medical science. He had no great hospital appointment; he had no pupils to spread his fame; and he had no position at the Court or in the College of Physicians to give him prestige. His success in practice must have been due to his own personality, his sincerity, his great industry, and his direct influence upon his patients. It is abundantly evident from his letters that he enjoyed not only the exercise of his art but the opportunity it gave his broad humanity to be a real comforter and friend to his patients. He evidently had the happy knack of getting on easy terms with his patients; he had Mirabeau's "don terrible de la familiarité," for he writes, "I would rather be familiarly happy than acquire distant veneration."

Lettsom's Character.

It was possibly this equable temperament, and this placidity in the presence of disaster, which led to the well-known lampoon:—

> "When any sick to me apply,
> I physicks, bleeds, & sweats 'em;
> If after that they choose to die,
> What's that to me,
> I LETTSOM."

His pliability may have led to his being caricatured in the *Westminster Magazine* of September, 1782, under the title of "Dr. Wriggle or the art of rising in physic." He philosophically refers to this as "Very complimentary; for what is greater honour, when an enemy professedly attempts to injure you, that you have so lived, as to leave him incapable of saying a bad thing of you?"

Lettsom did not seek to escape enmity by fearing to speak out or by refraining from carrying any project through to a successful end. Yet many of his projects met with violent opposition, abuse, and ridicule, and in his loyalty to them and his friends he must often have risked damaging his professional career. As a fervent disciple of his friend Edward Jenner he warmly espoused the cause of vaccination at a

time when it was still abused and opposed, with the result that "in Germany vaccination had nearly extinguished the small-pox" and "was more general in every part of Europe than in England." Evidently this British discovery of medicine in the eighteenth century met with the same reception in its native land as did Lister's in surgery in the nineteenth century. His support of the Humane Society, his enthusiasm for the improvement of prisons, his divagations into the work of the Philosophical Society, certainly show no self-seeking, did not improve his professional status, encountered strong opposition, and required much courage. His crusade for the mangel wurzel, as is seen in Boswell's verses, only exposed him to ridicule. He did not flinch at opposing fashion, or fear to show that he had a frugal mind, when he animadverted upon the practice of wearing the hair powdered, as unnecessarily consuming a vast quantity of flour. He undertook the ungrateful task of exposing quackery. Courage could never have failed him, and it must be due to his *suaviter in modo* that he was able to do so much and yet preserve his position and his friends. An instance of this courage in private life is shown by the charming, delicate, and feeling letter he wrote to his friend Boswell, deploring that "in scenes of pleasure which I have cordially enjoyed ..... I have observed, not merely a too frequent use of the glass, but that mixture of liquors which, as a professional man, I can add, tends to injure the best human fabrick." This required courage as well as tact, and was done in such an evidently sincere and friendly way that we are glad to see that Boswell in his reply wrote: "I am not cheerful at present; the visible wearing away of Sir Joshua Reynolds depresses me much; and, besides, I have not been so attentive as I should be to your most friendly recommendations as to regimen. *Spero meliora.*"

Lettsom apparently had the gift of friendship and the gentle art of not making enemies. Still, had he been as chaste as ice and pure as snow, we know he could not have escaped calumny. It is the more remarkable that his biographer only finds it necessary to defend his memory from two suggestions. One was because, "by those who were ignorant of his true character, he had been accused of a licentious attachment to the fair sex." This slander is treated as an idle story based on an exaggeration of his enthusiastic attachment to womanhood. He loved the company and conversation of enlightened women, and this "may account for an unguardedness of behaviour which subjected him to severe censure—he was imprudent, but certainly not vicious." He evidently lived on good terms with his wife, possibly all the more faithfully, as they did not see too much of one another! While he was plunged in his work in London, and living in Sambrook-court, she appears to have passed much of her time at Grove Hill, where "he generally dined on Sundays, and occasionally slept there." This will explain a reference to his wife in one of his letters: "I love her after 14 years' yoking better than in the honeymoon, and, wert thou yoked likewise, I could add something, perhaps new, upon the economy of love. Half the unhappy couples I have seen have been among daudlers, who have always been about their wife's apron-strings—not considering that 'the sweetest honey is loathsome, in its own deliciousness .....' I find that those short intervals of my wife's company affords a higher realism of her society, and makes a volatile Creole, in his nature and essence changeable, more fixed to an object where familiarity has not cloyed and sentiment has not become insipid."

The only other charge against Lettsom's character to which his biographer thinks it necessary to reply is that of vanity, and to this he answers: "It is admitted. Where is the individual that could withstand all temptation to vanity, and if he found himself every day, both in public and in private, the theme of an unanimous applause and approbation? There is little or no harm in a modest indulgence of the universal passion, so long as a consciousness of the rectitude of our motives and the uprightness of our conduct preaches self-reproach."

Death of Lettsom.

Lettsom's vitality must have been enormous. Although as early as his thirty-ninth year he talks of "the buffetings of his slender habit and weak constitution," yet in his sixty-sixth year he writes, "I am as alert as in the days of my youth." Still he is sufficiently anxious at times about his health to write, "I fancy immediately upon illness that I am going to the Majority; but," he at once adds, "feeling some little comfort in having done something in the world, which persuades me that I shall meet my predecessors with pleasure, I soon sleep my distempers off." He must have been a sound sleeper, for, as I have already narrated, he often did not have 20 minutes' leisure in a week; he passed 19 years in London without a single holiday; and from the age of 23 he was "in perpetual exertion" in his profession.

To such a temperament as Lettsom's death came as he would have wished it—swiftly and mercifully. On Oct. 22nd, 1815—Waterloo year—he assisted at a post-mortem examination, remaining for two hours in a cold room. Next day he felt chilly and unwell. On the 25th he wrote a note saying he had had a rigor, followed by a dreadful night, but that he was up and intent on seeing a few patients. He added: "For the last 27 years I have not been confined by illness." Two days later he was urged to see Dr. Babington, but answered "that he should be better in a few days, and that he wished for no one to attend him." His dauntless spirit, in spite of the entreaties of his friends, took him out to see a poor patient in Whitecross-street, but on his return he had to be lifted from his carriage, and that evening took to his bed. Even here, and in spite of excruciating pain which prevented him from turning without assistance, he was eager to get reports on his patients and to make arrangements to attend the approaching anniversary of the Philosophical Society. On the following day, Oct. 30th, he appeared improved—possibly in consequence of the unusual though short rest after 27 years at full speed—but next day great debility came on, and he died on Wednesday, Nov. 1st, 1815, between 3 and 4 o'clock in the morning, ten days after performing the post-mortem, and five days after he had been out to visit his last patient. He was in his seventy-first year. He had warmed both hands against the fire of life, and, when it sank, I have no doubt he was ready to depart.

Foundation of the Medical Society of London.

I have completed this sketch of our Founder's life before describing when and how our Medical Society came into existence. Lettsom's multifarious writings were frequently issued in the form of short pamphlets to which he gave the title of "Hints." On June 23rd, 1773, he issued a pamphlet entitled "Hints on the Establishment of a Medical Society of London." The vigour with which he followed up design by action is shown by the fact that the Society was inaugurated that same year, and the completeness with which he planned his scheme is demonstrated by observing that the "statutes" he drew up in 24 pages are in such order and detail that there will be found but trifling points of difference when we compare them with our present rules of 145 years later. After an introduction, in which he says that societies "excite a generous ardour in liberal minds and raise even envy itself into useful emulation" and that "the principal part of our knowledge must be ever derived from comparing our observations with those of others," he points out the advantages of discussion, the usefulness of honorary rewards, and the virtue of a medical library. We still follow Lettsom's original design in numerous details of the Society's regular existence. Naturally, having received the distinction of following the illustrious Lettsom in this honourable chair, I turned with particular interest to inform myself of his directions to the Presidents of all time. I note that the President "shall regulate all debates, and prevent any from being prosecuted upon trivial subjects," and that "all members shall pay implicit obedience to the President in the execution of his office"! The only one of Lettsom's statutes which we appear to have quite neglected is No 4, Chapter IV, where it is enacted that "the President, whilst in the chair, shall be covered, except when addressing himself to the whole Society"!

The early meetings of the Society were held in Lettsom's house in Sambrook-court, Basinghall-street, and its first home was in Crane-court, Fleet-street. Here the Medical Society remained until 1788, when Lettsom presented it with the freehold of a house in Bolt-court, Fleet-street, where it was established until 1850. The house was valued at £2500. It is rare for benefactors to make such handsome gifts during their life-time. The shifting of the centre of medical life more westward led to our then taking a house in George-street, Hanover-square, and we were finally established in our present house in 1871. The fine picture in this room shows a group of the Founders of the Society, the central figure being Lettsom standing up in the act of presenting the deeds of our Bolt-court house to the President. This oil-painting by Samuel Medley is a valued possession of our Society.

Medley was the better able to execute this as he was the associate and intimate companion of Lettsom, Sims, Babington, Blair, Hooper, and Jenner. The painting contains 22 life-like portraits of our Founders, most of them being the leading medical men of the period. It is doubtful if there exists another medical picture containing so many actual portraits of well-known individuals. Edward Jenner is represented standing close to the left shoulder of the President. It will be noticed that his figure is smaller than the others and somewhat out of perspective. This is because Jenner was not one of the original Founders and did not appear in the picture as originally painted. His portrait, in consideration of his celebrity, was painted in later. It will be noticed that the President is seated, and following Lettsom's "Hints," he remains covered and is wearing his cocked hat.

The Fothergillian medal, "in gold of 10 guineas value," was founded by Lettsom in a letter addressed to the Fellows of the Society on May 25th, 1784. In 1791 Lettsom himself won the prize essay for the Fothergillian gold medal. He delivered the annual oration in 1778, choosing as a subject "History of the Origin of Medicine." He said he had to deliver this oration at short notice, but was able to effect it by the facility with which he could refer to his 40,000 notes! How did he manage it in those days before card-filing systems were invented? On March 8th, 1804, he again delivered the annual oration, "On the Origin of Vaccine Inoculation with a Biographical Account of Dr. Jenner," to whom the Fothergillian gold medal was then presented.

In 1850 the Society perpetuated the name of our founder by establishing the Lettsomian lectures.

The Society's Transactions.

The published records of the Society's work appeared under the title of "Memoirs" or "Proceedings," and, later on, under the present one of "Transactions." We find they exist from 1787 to 1805, and from 1810 to 1817, but between these two periods there is a hiatus. Subsequently there appeared only one volume in 1846 and another in 1861. The publication of the "Transactions" was resumed in 1872 and has continued annually ever since.

As our "Transactions" covered the period of the Peninsular and Waterloo campaigns, I looked through them to see in what way they reflected the military medicine and surgery of the period. I confess to considerable surprise in not finding a single communication reflecting the wars in which our country was then engaged. This is striking when we remember that in the session of 1915–16 every single communication made to the Society was on a war subject, with the exception of the annual oration by myself on "Shakespeare and Medicine." But it is also noticeable that the Boer War is reflected in our "Transactions" by one solitary communication on "Typhoid Fever." This shows that our previous wars have been of the nation's life a thing apart—the present world war embraces our whole existence.

Records of the Deaths of Shakespeare and Nelson.

I had occasion last year in "Shakespeare and Medicine" to point out that our Society possesses the only record of the nature of the death of our national poet. It is curious that we also possess a record of the death wound of our national hero, Nelson. The Minute Book of the Medical Society for Dec 23rd, 1815 contains the following: "A letter was read by Dr. Gillespie from the surgeon on board the *Victory*, who dissected the wound of the late Admiral Nelson, describing the progress of the musket ball. It passed through the left shoulder, penetrating one lobe of the lung, and, after perforating the vertebræ, was lodged in the surrounding muscles."

Conclusion.

The rest of the chronicles of the Medical Society, and all that it has done, are they not written in the handsome volumes of the "Transactions"—a storehouse of interest and instruction to all our members?

In this sketch of our Founder I hope I have succeeded in strengthening the loyalty of all Fellows to the oldest Medical Society in London, and in conveying to your minds the attractive picture of the Founder which I have received from a perusal of his life and letters. It is well summarised by his biographer, who describes Dr. John Coakley Lettsom as "good, humane, benevolent. We have lost in him the sensible, firm, and upright friend, the able, honest, and experienced physician, and the pleasing, instructive companion of a social hour." Our Society need seek for no better exemplar.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE second appeal for subscriptions to this Fund is now open, and support is urgently sought. The following subscriptions have been received up to the end of last week additional to those already announced:—

	£	s.	d.		£	s.	d.
Dr. Herbert Spencer ...	25	0	0	"Anonymous"	5	0	0
Mr. J. B. Lawford ...	5	0	0	Dr. S. M. Salaman ...	1	0	0
Mr. W. C. Ball	10	10	0	Dr. C. D. Muspratt ...	5	5	0
Dr. Middleton	5	5	0	Dr. F. W. Collinson ...	5	5	0
Dr. George Hunter ...	1	1	0	Dr. H. Russell Andrews	5	5	0
Dr. A. E. Nicholls ...	2	2	0	Dr. F. E. Batten	5	0	0
Dr. Lawrence Franklin	10	10	0	Dr. F. J. Baldon... ...	1	1	0
Mr. J. Elliot Square ...	5	0	0	Dr. D. R. Moir	1	1	0
Dr. J. B. Hurry	1	1	0	Dr. T. Jenner Verrall	2	2	0
Mr. F. Neal	0	10	0	Miss Pymm	1	0	0
Dr. J. W. Carr	5	0	0	Mr. Frederic Durham ...	2	2	0
Per Sir R. J. Godlee ...	3	10	0	Dr. R. Hingston Fox ...	1	1	0
Dr. Alfred Cox	2	2	0	Dr. D. Fogarty	1	1	0
Sir StClair Thomson ...	10	10	0	Dr. W. B. Russell	0	7	6
Dr. John Matthews ...	10	10	0	Prof. T. K. Monro ...	5	5	0

The treasurer also desires to acknowledge the receipt of £8 14*s.* 10*d.* from the Pharmacy Board of New Zealand, received through Mr. C. W. Nielsen, the Registrar.

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W. 1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

IRELAND

(FROM OUR OWN CORRESPONDENTS.)

Irish Doctors of Military Age.

A CONSIDERABLE amount of interest has been aroused in Irish medical circles with reference to the Local Government Board's action regarding the appointment of medical officers to dispensary districts. The Board made a rule refusing to sanction such appointments in cases where the successful candidate was eligible for service in the Royal Army Medical Corps, and this procedure was questioned by some of the boards of guardians concerned. The matter was finally decided, however, by a judgment of the Lord Chief Justice, when an application was made by the Lismore guardians to compel the Local Government Board to exercise their discretion according to law in sanctioning the appointment of Dr. T. Cronin as medical officer of the Tallow dispensary district. The Local Government Board refused sanction on the ground that Dr. Cronin was of military age and eligible for service in the Royal Army Medical Corps. The Lord Chief Justice, in delivering judgment, made an important statement, of which the following is a brief summary:—

He agreed that the Local Government Board could take extraneous matters into consideration provided they had kept in the forefront the provision of sufficient medical relief for the sick poor. It was admitted on both sides that the real question at issue was whether the Local Government Board was entitled to have regard to any considerations other than those directly relating to such provision. The question for the decision of the Court was narrowed down to this: Was it open to the Local Government Board in the exercise of their discretion to require that in view of the national and military exigencies, the appointment of medical officers during the war should be confined to practitioners over military age, in cases in which other suitable and satisfactory arrangements could be made for the medical relief of the sick poor? For himself he was satisfied that so long as they had due regard to the paramount necessity of suitable provision for the medical relief of the sick poor it was open to that great department of the State, dealing with appointments which were paid for, in some degree at least, out of imperial funds, to refuse, in these days of national and unprecedented strain and superhuman effort, to encourage by premium or inducement medical practitioners of military age to seek civil employment. In the present state of things was it conceivable that the Local Government Board alone should stand aloof, and that it was not its duty as well as right to lend a hand by endeavouring as far as possible to marshal the medical assets of the country. He declined to entertain the suggestion that the Local Government Board were solely actuated by the indirect motive of enforcing the conscription of the medical profession in Ireland. To attempt to enforce conscription was one thing, but to encourage the

performance of a patriotic duty by withholding premiums or inducements to seek civil employment was another and a wholly different matter. There was no evidence that the Local Government Board had in any respect failed to have regard to the provision of suitable and satisfactory medical relief for the sick poor of the Tallow district. Accordingly the application failed both in law and upon the merits.

Mr. Justice Gibson and Mr. Justice Kenny concurred and the conditional order was discharged without costs, no costs being asked for by the Local Government Board. In view of this judgment the Local Government Board have been lately refusing to sanction payment to Poor-law medical officers who are eligible for military service, although in some cases the duties for which payment is being refused have been already carried out—in the case of the Monasterevan Dispensary Dr. McKenna has been acting for the last one and a half years without payment, and sanction has not yet been obtained. In three cases, however, the Local Government Board has sanctioned payment contrary to its own rule, and for no reason that can be ascertained. The result of the whole affair seems to be that a good deal of discontent has been caused by the application of what has been termed "vicarious conscription," and those who approved the Local Government Board's policy are now somewhat puzzled by the exceptions.

Health of Belfast.

At a meeting of the Belfast city council, held on Jan. 2nd, it was reported that during 1917 there were registered 6541 deaths as compared with 6496 in the preceding year. The death-rate, calculated (apparently) upon a population of 394,000, was 16·6 per 1000, which is the lowest on record, the figure for 1916 being 16·7. The zymotic death-rate was 1·1 (414 deaths), and was also the lowest on record, the rate being 1·7 (650 deaths) in 1916. The disappointing features of the health of Belfast last year were (1) that the deaths from typhoid fever (though they only totalled 41 out of 277 notifications) are more numerous than they have been since 1908; (2) that the infantile mortality rate has risen to 128 per 1000 births, as compared with 113 in the previous year; and (3) worst of all, the high tuberculosis mortality-rate: there were 929 deaths from pulmonary tuberculosis, giving a rate of 2·4, while, in 1916, the deaths were 830, with a rate of 2·1. This means that 99 more people died of pulmonary tuberculosis in 1917 than in 1916, and since 1906 it is the highest number recorded. If the explanation given—i.e., that this high Belfast pulmonary tuberculosis-rate is due to the number of soldiers who, on being discharged from the army, came home to die of consumption—be true, it conveys a grave impeachment of the efficiency of medical examination for the Army, and it is really hard to believe that almost a hundred discharged soldiers should have actually died of pulmonary tuberculosis in 1917 in Belfast. During the last two years the Belfast Corporation have expended something like £70,000 in working a tuberculosis scheme, with the result, as a member of the City Corporation pointed out at the meeting on Jan. 2nd, that there is a largely increased tuberculosis death-rate. Apparently tuberculosis is not to be got rid of as easily as was thought, at least, by domiciliary and sanatorium treatment.

Typhoid Fever in County Tyrone.

At the present time a serious epidemic of typhoid fever is reported in that district of county Tyrone which lies between Sixmilecross and Carrickmore, and already several deaths have occurred. So far the origin of the outbreak has not been traced, but it is a curious and suspicious circumstance that at about this period of the year, for some time past, outbreaks of a similar nature have taken place in the same district.

The Home for Neurasthenics at Leopardstown Park.

Last September the announcement was made that Mrs. Bernard Dunning had presented the estate and mansion of Leopardstown Park, co. Dublin, to the Ministry of Pensions as a permanent home for sailors and soldiers disabled in the war. The Ministry propose to establish there a home for neurasthenics and similar cases in need of treatment, and ultimately to utilise the gift—which is free of all charges and in perpetuity—as experience should show to be most desirable. The Management Committee has now appointed, with the concurrence of the Ministry of Pensions, Captain H. B. F. Dixon, R.A.M.C., resident medical officer.

Jan. 7th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Increase of Hydrophobia.

Hydrophobia continues to cause anxiety, the number of persons presenting themselves at the Pasteur Institute for treatment of bites having increased five- or six-fold. The chief cause doubtless is the fact we have already noted—viz., the increase of stray dogs abandoned by masters who have either been called up or can no longer afford to feed them at the increased price of food, or who desire to avoid paying the higher dog-tax. A contributory factor is the lack of veterinary surgeons, most of whom have been mobilised, and the consequent relaxation in the control of canine disease. In spite, however, of the increase in the number of cases treated the number of deaths from hydrophobia has remained remarkably low: one in 1915, three in 1916.

Tuberculosis in the Army.

An important debate was recently opened in the Senate by M. Louis Martin on the incidence of tuberculosis among French soldiers as reported in foreign (chiefly American) journals. Some of these have represented the French Army as being riddled with the disease and as constituting a danger for the American troops coming to France. As M. Justin Godart, the Under Secretary of State for the Service de Santé, has shown, this is an exaggerated statement of the case. True it is that a great effort is being made by the medical and sanitary experts to deal wisely with the tuberculosis peril to which the war has given rise, the disease developing as a result of stress among the men of poor physique and spreading to the civilian population by contact with discharged tuberculous soldiers who have been sent home. To overcome the inertia of public opinion and to convince patients' relatives of the necessity of preventive measures the promoters of the campaign thought it advisable not to underrate the situation, which is in reality not giving rise to serious anxiety. In the majority of cases tuberculosis has developed in men in whom it existed before entering the Army and not as a result of infection in the Army, special attention to the possibility having been exercised by the military doctors. From August 2nd, 1914, to Oct. 31st, 1917, 81,500 soldiers were discharged on account of tuberculosis without pension and 6579 with pension, the State only granting a pension in the case of soldiers who became tuberculous while serving in the Army. Considering the immense numbers of soldiers in the Army the number of cases of direct infection may therefore be considered negligible. Moreover, the weeding out of tuberculous suspects from the Army is conducted with such vigour that a number of men discharged as tuberculous and included in the total given are, in fact, not tuberculous. Thus at one examining centre of 298 cases diagnosed as tubercle only 208 were found to be so with certainty. In the Parisian hospitals of Charité and Vésinet reserved for cases diagnosed as tuberculous Dr. Sargent found that 301 out of 600 were not tuberculous and could be sent back to the Army. The same proportion has been observed in a number of other special hospitals. In reality the Service de Santé has obtained excellent results from the issue of its numerous orders with the object of eliminating incipient tuberculosis among the soldiers, and in so doing has deliberately faced the risk of creating exaggerated fears.

The Danger of High-heeled Shoes.

Professor Quénu's recent communication to the Academy of Medicine on the inconveniences to women resulting from the wearing of high-heeled shoes has attracted some attention. Along with Dr. Lucas-Championnière, Dr. Dagron was a pioneer in resisting this evil practice, and later Dr. Quiserne took up the matter. Professor Quénu has supplemented direct observation by certain radiographic examinations and cinematograph illustrations. He has thus been able to demonstrate grave deformity, such as failure of the tarsal arch, straining of tendons, and excessive fatigue of the calf muscles. The whole poise of the body and even of the head is altered, the vertebral column showing an S-curve. As a consequence of the spinal deformity orthostatic albuminuria has been noted. Women whose carriage has thus been altered cannot resume a normal gait for field sports or even for self-protection when forced to run to

escape danger in the street. The radiograms taken by M. Ménard show that in a normal foot the calcaneum lies obliquely, pointing upward at an angle of 17° opening forward, but that when a 9 cm. heel is worn the calcaneum is tilted in the opposite direction at an angle of 13° opening backward, a difference of 30° between the normal and artificial positions. The astragalus takes on an extreme obliquity and is pressed forward on to the scaphoid. The angle of the first metatarsal with the horizontal increases from 20° to over 60°. The cinema film at a very low speed showed the details of the altered carriage as determined by the deforming heels in comparison with the normal carriage barefoot. Although the lay press has given much publicity to Professor Quénu's communication, a survey of boot-makers' stock-in-trade has not so far shown any evidence that his advice has been followed.

Jan. 7th.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

A MEETING of the Governors and General Council of King Edward's Hospital Fund for London for the purpose of awarding grants to the hospitals, convalescent homes, and consumption sanatoria for 1917 was held on Dec. 13th at St. James's Palace, the SPEAKER of the House of Commons being in the chair.

Lord SOMERLEYTON (honorary secretary) announced that the donor of £35,000, who desired to remain anonymous until that day, was Viscount Astor, and on the motion of the SPEAKER it was unanimously resolved that the best thanks of the Council be conveyed to Lord Astor for his very handsome and generous contribution to the Fund.

Lord REVELSTOKE (the honorary treasurer) said that the total general receipts for the year to Dec. 8th, less expenses, amounted to £205,781 4*s.* 9*d.* This included the donation of £35,000 from Lord Astor. It also included the final instalments of £25,567 10*s.* 5*d.* received from Sir Walter Trower on account of the bequest of the late Isabella Countess of Wilton of the residue of her estate. The total residue amounted to no less than £163,000. It was only because of such large contributions as these that the Fund was able to face with equanimity so large a distribution as £190,000.

Sir WILLIAM COLLINS said that the League of Mercy would probably be able to contribute not less than £15,000.

Sir WILLIAM CHURCH (the chairman of the Distribution Committee) presented the report of that committee.

This stated that the sum available for distribution amongst the London hospitals would be £181,000, as against £162,500 in 1916, and £133,500 in 1915. Of the total amount distributed, £151,925 had been applied in the form of grants to maintenance, an increase of £35,0 over the corresponding total in 1916, and of £34,400 over 1915. In making these awards, the Distribution Committee had not lost sight of the principle of helping the hospitals which have maintained or improved their position by their own efforts. Last year several exceptional grants had been made in reduction of debt, after a careful consideration of the steps already being taken to secure local and general support. This year several additional grants had been made to supplement the amounts collected by special efforts of the institutions concerned. The committee recommend with special satisfaction the grant of £5000 to extinguish the mortgage debt on Charing Cross Hospital. Ten years ago this debt stood at £85,000 with a provision of only £7800 towards its redemption; and the position of the hospital, as the result of premature extension, had been rendered so precarious that the Fund only felt justified in continuing its support "in view of the new management." At the beginning of the year 1914 the debt was still close on £50,000. The chairman and committee were to be congratulated on having reduced this debt to £5000 during the war, while at the same time largely increasing the current income. The grant of £5000 by the Fund (making £10,700 in all contributed to this object) would thus enable the hospital to begin the new year free of debt. The following grants in aid of schemes of building expenditure which had been deferred during the war were now recommended for renewal:—Hospital and Home for Sick Children, Sydenham (1915), £75 to central heating; Queen Charlotte's Lying-in Hospital (1913), £1000 to new out-patient department; St. Mary's Hospital for Women and Children, Plaistow (1913), £1500 to new nurses' home and out-patient department.

Mr. F. W. FRY (honorary secretary) presented the list of awards, which has already been published in the press. Among the largest sums allocated are £15,500 to the London Hospital, £9500 to Guy's Hospital, £8000 to Charing Cross Hospital, and £7500 to King's College Hospital.

Dr. E. FRESHFIELD (the chairman of the Convalescent Homes Committee) presented the report of that committee, remarking that the Governors and General Council had fixed the sum available for distribution among convalescent homes and consumption sanatoria at £9000, as against £7500 in 1916. This was an increase of £1500 on the largest sum ever before placed at the disposal of the Convalescent Homes Committee.

The list of awards having been presented by Mr. J. G. GRIFFITHS (honorary secretary), the CHAIRMAN moved the adoption of the report and awards, and in doing so read a letter from the King congratulating the Council upon their ability to distribute so large a sum of money as £190,000. The letter continued:—

His Majesty realises also the advance in medical and surgical science as evidenced by the work performed at the hospitals of London. In many cases limbs have been saved, and, indeed, valuable lives preserved which in the no distant past must have been sacrificed.

The King is glad to see that the Distribution Committee have paid special attention this year to the accommodation provided for nurses, to whose services every hospital patient would gladly testify. The reports of the visitors have shown that the importance of due solicitude for the health and comfort of these workers is realised by the responsible authorities of the hospitals.

The SPEAKER said that the bulk of the sum available for distribution would go in grants to ordinary maintenance, where it was greatly needed to assist the hospitals to bear the strain of high prices and other difficulties. From the figures printed in the Fund's statistical report it appeared that the ordinary expenditure in 1916 falling on the normal sources of hospital income (that is, not covered by War Office payments for the treatment of wounded soldiers) was £104,000 more than in 1915, and £171,000 more than in 1913. That was the measure of the increased need which the Fund had to do its share in meeting, and no doubt the figures for 1917 would be still larger. Towards this extra £104,000 the Fund contributed in 1916 an extra £28,000; there was, therefore, ample reason why the Fund should again increase its total as far as could be done with safety.

Sir ARTHUR STANLEY having seconded the motion, the adoption of the reports was carried unanimously.

A meeting of the General Council of the Fund was held on Jan. 7th at the offices of the Fund, 7, Walbrook, E.C., the Earl of BESSBOROUGH in the chair, when Lord SOMERLEYTON stated that the Governors had appointed as new members of the General Council Viscount Astor, Mr. Yvon R. Eccles, and Mr. G. Lawson Johnston. The resolutions providing for the work of the Fund for 1918, which had been approved at the meeting of the Governors and General Council, were formally adopted.

URBAN VITAL STATISTICS.

(Week ended Jan. 5th, 1918.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality further rose to 18·0, against rates steadily rising from 11·9 to 17·9 per 1000 in the five preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 21·3, or 0·2 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 8·1 in Wallasey and in Barrow-in-Furness, 9·6 in Enfield, and 10·6 in Southend-on-Sea, to 25·1 in Southampton, 25·4 in Warrington, and 26·8 in Gateshead. The principal epidemic diseases caused 432 deaths, which corresponded to an annual rate of 1·3 per 1000, and included 154 from measles, 143 from whooping-cough, 60 from infantile diarrhœa, 59 from diphtheria, 10 from scarlet fever, and 6 from enteric fever. Measles caused a death-rate of 2·3 in Brighton, 2·8 in Merthyr Tydfil, 2·9 in Cardiff, 3·5 in St. Helens, and 4·1 in Aberdare; and whooping-cough of 2·2 in Gateshead, 2·7 in Middlesbrough, and 3·1 in Wigan. The 1227 cases of scarlet fever and 1670 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 34 below and 3 above the numbers remaining at the end of the previous week. Of the deaths from all causes in the 96 towns 223 resulted from violence. The causes of 55 deaths were uncertified, of which 12 were registered in Birmingham, 11 in Liverpool, and 5 in Gateshead.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality was 16·0, against rates increasing from 11·9 to 15·3 per 1000 in the seven preceding weeks. The 329 deaths in Glasgow corresponded to an annual rate of 15·4 per 1000, and included 8 from whooping-cough and 3 each from measles, diphtheria, and infantile diarrhœa. The 99 deaths in Edinburgh were equal to a rate of 15·5 per 1000, and included 3 from diphtheria.

Irish Towns.—The 140 deaths in Dublin corresponded to an annual rate of 18·3, or 2·0 per 1000 below that recorded in the previous week, and included 4 from infantile diarrhœa, 3 from measles, and 2 from whooping-cough. The 147 deaths in Belfast were equal to a rate of 19·5 per 1000, and included 7 from whooping-cough, 4 from measles, and 2 from enteric fever.

Mrs. Bedford Fenwick has been unanimously re-elected President of the National Council of Trained Nurses of Great Britain and Ireland for a fourth term of office.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed.

Capt. J. McK. Ferguson, R.A.M.C., attached Connaught Rangers, qualified at Belfast in 1914, and joined the R.A.M.C. soon after the outbreak of war.

Wounded.

Capt. J. W. Macfarlane, M.C., R.A.M.C., attached R.F.A.
Capt. H. N. Collier, R.A.M.C.
Capt. G. R. Grant, M.C., R.A.M.C.
Capt. F. M. S. Hulke, R.A.M.C., attached Coldstream Guards.
Capt. J. H. Jordan, R.A.M.C., attached R.F.A.
Capt. F. B. Julian, R.A.M.C.
Capt. H. Dolman, Australian A.M.C.
Capt. S. H. Seccombe, Australian A.M.C.
Capt. J. H. Barry, D.S.O., M.C., R.A.M.C., attached London Regiment.
Capt. T. M. Crawford, R.A.M.C., attached Rifle Brigade.
Lieut. W. H. Newton, R.A.M.C.
Capt. A. Ramsbottom, R.A.M.C.
Capt. L. Zealand, R.A.M.C., attached Royal Scottish Fusiliers.
Lieut. G. H. G. Davie, R.A.M.C.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported :—

Lieut. L. C. Flanegan, Tank Corps, late Essex Regiment, killed in action, only son of Dr. H. J. Flanegan, of Clacton-on-Sea.

Capt. G. W. C. Harker, London Regiment, died of wounds, younger son of Dr. T. Harker, of Bournemouth.

THE HONOURS LIST.

The names of the following members of the medical profession are included in a list of appointments to the Order of the British Empire published in the *London Gazette* on Tuesday last :—

Knights Commanders (K.B.E.).

Col. Sir George Thomas Beatson, K.C.B., D.L., V.D., Chairman, Scottish Branch, British Red Cross.
James Cantlie, Member of Council and of Executive Committee, British Red Cross.
Walter Morley Fletcher, F.R.S., Secretary, Medical Research Committee.
James Galloway, C.B., Chief Commissioner for Medical Services, Ministry of National Service.
Kenneth Weldon Goadby, Member of War Office Committee for the Study of Tetanus.
William Henry Thompson, Scientific Adviser to Ministry of Food.

Commanders (C.B.E.).

Lt.-Col. John Hubback Anderson, Australian Imperial Forces.
Thomas Elwood Lindesay Bate, C.I.E., late County Director, British Red Cross.
Col. Robert Dawson Rudolph, Canadian A.M.C.
Col John Scott Riddell, M.V.O., T.D., Red Cross Commissioner, N.E. Scotland.
Lockhart Stephens, County Director, British Red Cross.
Lt.-Col. David Wallace, C.M.G., Red Cross Commissioner, E. Scotland.
John Horatio Yolland, Chief of Staff, British Red Cross.

Officers (O.B.E.).

Henry Barnes, J.P., County Secretary and Treasurer, British Red Cross.
Maj. Lionel Oxborrow Betts, Australian A.M.C.
Herbert Edmond Cuff, Principal Medical Officer to the M.A.B.
Thomas Elwood Dillon, Consul, Porto Alegre, Brazil.
Richard Henry Grimbly, Assistant County Director, British Red Cross.
Maj. Hugh Bennett Lewers, Australian Imperial Forces.
Finlay Matheson MacKenzie.
Capt. Edmund Distin Maddick.
Maj. Thomas McKibbin, New Zealand Expeditionary Force.
George Reid, M.O.H., Staffordshire C.C.
John Robertson, M.O.H., Birmingham.
John Russell, Assistant County Director, British Red Cross.
Charles Stein, Commandant, Park House Auxiliary Hospital.
Lt.-Col. Edward Newbury Thornton, S. African Hospital, Richmond Park.
Bt.-Col. Gerran Sims Woodhead, V.D., R.A.M.C.
Joseph Woods, Senior Dental Surgeon, Mid Ulster, Switzerland.
Sarat Kumar Mullick, Honorary Secretary, Bengalee Regiment Committee.
Arthur Ferguson Macallan, Director of Ophthalmic Hospitals, Egypt and the Sudan.

Members (M.B.E.).

Francis Richard Cassidi, First Line Hospital, Derbyshire.
Arthur Vernon Davies, Assistant County Director, Order of St. John of Jerusalem, E. Lancs.
Capt Percy Thorndon Remington, Dental Officer, Australian A.M.C.
Herbert Llewellyn Rutter, Wounded Convoys Officer, Northumberland.
Maj. Thomas Lewis Lindsay Sandes, S. African Hospital, Richmond Park.
Capt. Arthur Fraser Sutton, Senior Dental Officer, Australian A.M.C.
Maj. Walter Henry Tofft, Australian A.M.C.
Mrs. Ella Gertrude Amy Webb, District Supt., St. John Amb. Brig., Dublin.

We continue the publication of the list of awards to medical officers commenced in THE LANCET of Jan. 5th. All are members of the R.A.M.C., unless otherwise stated. The dates in parentheses, in those cases where bars have been awarded, refer to the number of THE LANCET in which a record of the original decoration will be found.

Bar to the Distinguished Service Order.

Temp. Capt. (acting Lt.-Col.) J. R. C. Greenlees, D.S.O. (May 1st, 1915, p. 938); Maj. (temp. Lt.-Col.) W. M. B. Sparkes, D.S.O. (June 10th, 1916, p. 1195); Capt. (acting Lt.-Col.) F. Worthington, D.S.O. (Jan. 22nd, 1916, p. 215).

Distinguished Service Order.

Capt. (acting Lt.-Col.) E. Alderson; Temp. Capt. J. Anderson; Lt.-Col. (temp. Col.) H. P. W. Barrow, C.M.G.; Capt. (temp. Lt.-Col.) F. L. Bradish; Capt. (acting Lt.-Col.) F. H. Bradley; Capt. (acting Lt.-Col.) C. S. Bebber; Temp. Capt. acting Lt. Col.) C. V. Bulstrode; Capt. T. Carnwath; Lt.-Col. S. W. W. Cochrane; Maj. (acting Lt.-Col.) R. Coffey; Maj. (temp. Lt.-Col.) R. T. Collins; Maj. (temp. Lt.-Col.) J. F. Cromble; Temp. Lt.-Col. J. E. H. Davies; Maj. (temp. Lt.-Col.) N. S. Dunkerton; Capt. (acting Lt.-Col.) W. Egan; Temp. Lt.-Col. T. R. Elliott; Capt. (acting Lt.-Col.) T. S. Eves; Capt. H. A. T. Fairbank; Capt. (temp. Maj.) A. W. Falconer; Capt. (temp. Lt.-Col.) A. T. Fatwasser; Maj. W. T. Finlayson, I.M.S.; Maj. (acting Lt.-Col.) D. L. Fisher; Lt.-Col. T. Fraser; Capt (acting Lt.-Col.) W. R. Gardner; Capt. G. G. Gauntlett; Capt. A. J. Gibson; Capt. (acting Lt.-Col.) H. Gibson; Capt. J. G. Gill, M.C.; Maj. (acting Lt.-Col.) J. M. Gover; Lt.-Col. (temp. Col.) H. W. Gratian; Capt. (acting Lt.-Col.) A. H. Habgood; Capt. A. G. Hebblethwaite; Lt.-Col. (temp. Col.) H. A. Hinge C.M.G.; Maj. (temp. Lt.-Col.) G. J. Houghton; Lt.-Col. (temp. Col.) J. W. H. Houghton; Capt. B. Hughes; Maj (temp. Lt.-Col.) R. N. Hunt; Capt. (acting Lt.-Col.) E. J. Kavanagh, M.C.; Maj. (temp. Lt. Col.) T. Kay; Maj. (temp. Lt.-Col.) G. A. Kempthorne; Capt. (acting Lt.-Col.) J. Du P. Langrishe; Capt. S. D. Large, M.C.; Maj. (acting Lt.-Col.) A. Leggat Maj. (acting Lt.-Col.) W. McCall. Capt. W. McK. H. McCullagh, M.C.; Temp. Capt. G. A. McCarty; Capt. J. W. McNee; Capt. (acting Lt.-Col.) J. A. Manifold; Temp. Lt.-Col. W. R. Matthews; Maj. (temp. Lt.-Col.) S. M. W. Meadows; Capt. G. W. Miller; Maj E. H. M. Moore; Lt. Col. (temp. Col.) G. A. Moore, C.M.G.; Maj. (acting Lt.-Col.) T. B. Moriarty; Capt. G. S. Parkinson; Lt.-Col. (temp. Col.) P. S. Penny, C.M.G.; Capt. (acting Lt.-Col.) E. C. Phelan, M.C.; Capt. (acting Lt.-Col.) A. M. Pollard; Lt.-Col. E. E. Powell; Temp. Capt. J. F. G. Richards; Capt. (acting Lt.-Col.) J. W. L. Scott; Maj. temp. Lt.-Col.) H. F. Snea; Lt.-Col. (temp. Col.) E. W. Slayter, C.M.G.; Capt. A. D. Stirling; Temp. Capt. A. Stokes; Capt. (acting Lt.-Col.) G. P. Taylor, M.C.; Capt. J. H. Thomas; Capt. (temp. Lt.-Col.) W. I. Thompson; Maj (acting Lt.-Col.) W. F. Tyndale, C.M.G.; Capt. (acting Lt.-Col.) W. Tyrrell, M.C.; Maj. E. B. Waggett; Maj. (acting Lt.-Col.) J. Ward; Maj G. W. Ware; Maj. (temp. Lt.-Col.) F. Whalley; Maj. (temp. Lt.-Col.) C. R. White; Maj. (acting Lt.-Col.) J. H. R. Winder; Capt. (acting Lt.-Col.) A. R. Wright; Lt.-Col. A. O. B. Wrougton.

Australian Army Medical Corps.—Maj. A. S. D. Barton; Lt.-Col. J. J. Black; Lt.-Col S. R. Burston; Maj. D. D. Cade; Maj. C. L. Chapman; Lt.-Col. M. H. Downey; Maj. R. S. McGregor; Lt.-Col. A. H. Moseley; Lt.-Col. H. S. Newland; Maj. J. J. Power; Lt.-Col. J. M. Y. Stewart; Lt.-Col. A. H. Thwaites; Maj. C. J. Tozer; Temp. Lt.-Col. C. E. Wassell; Maj. H. J. Williams.

Canadian Army Medical Corps.—Maj. (acting Lt.-Col.) A. T. Bazin; Maj. (acting Lt.-Col.) P. G. Bell; Lt.-Col. J. S. Davey; Lt.-Col. C. H. Dickson; Maj. (acting Lt.-Col.) J. J. Fraser; Temp. Lt.-Col. T. McC. Leask; Maj. G. S. Mistensill; Lt.-Col. T. J. F. Murphy; Lt.-Col. (temp. Col.) C. A. Peters; Maj. (temp. Lt. Col.) C. H. Reason.

New Zealand Army Medical Corps.—Maj. F. Cameron; Lt.-Col. C. T. H. Newton.

African Army Medical Service and Corps.—Maj. (temp. Lt.-Col.) P. S. Clarke, S.A.M.C.; Capt. T. S. Dunn, E.A.M.S.; Temp. Capt. H. B. Owen, Uganda Medical Service; Maj. D. M. Tomory, S.A.M.C.; Lt.-Col. A. B. Ward, S.A.M.C.

Indian Medical Service.—Lt.-Col. A. N. Fleming.

Bar to the Military Cross.

Temp. Capt. R. Briffault, M.C. (Dec. 22nd, 1917, p. 961); Temp. Capt. M. S. Bryce, M.C. (August 4th, 1917, p. 175); Temp. Capt. G. R. Burwell, M.C. (Jan. 6th, 1917, p. 38); Temp. Capt J. Macgregor, M.C. (M.C. not yet officially announced); Temp. Capt. B. C. Tennent, M.C. (Sept. 1st, 1917, p. 361).

Military Cross.

Temp. Lt. E. H. R. Altounyan; Capt. J. G. Anderson; Temp. Capt. R. R. Arcnibald; Temp. Capt. B. F. Bartlett; Temp. Capt. M. F. Bliss; Temp. Capt. P. R. Boswell; Capt. C. G. Brentnall; Capt. C. D. M. Buckley; Temp. Capt. A. Campbell; Temp. Capt. G. M. Campbell; Capt. N. Cantlie; Temp. Capt. W. T. Collier; Temp. Capt. R. C. Cooke; Temp. Capt. A. K. Cosgrave; Capt. T. J. Costello; Temp. Capt. J. P. Davidson; Capt. T. McN. Davie; Temp. Capt. H. S. de Boer; Capt. I. D. Dickson; Lt. W. Donald; Temp. Capt. J. H. Elliott; Temp. Capt. H. Emerson; Temp. Capt. J. C. Fergusson; Temp. Capt. L. U. Geraty; Temp. Capt. E. Gordon; Capt. F. J. Green; Capt. (temp. Maj.) W. W. Greer; Capt. J. C. Grieve; Temp. Capt. L. L. Hadley; Capt. A. C. Hammond-Searle; Temp. Capt. J. F. C. Haslam; Temp. Capt. A. J. Hawes; Temp. Capt. H. A. Haynes; Temp. Capt. H. G. Hobson; Temp.

Capt. G. Holroyde; Capt. L. E. Hughes; Temp. Capt. J. N. Humphrey; Temp. Capt. D. M. Hunter; Temp. Capt. D. L. Hutton; Capt. T. D. Inch; Capt. T. R. Kenworthy; Temp. Capt. A. E. Knight; Temp. Capt. A. C. W. Knox; Capt. W. H. Leslett; Temp. Capt. A. A. Lees; Capt. R. H. Leigh; Temp. Capt. K. T. Limbery; Temp. Capt. P. C. Litchfield; Temp. Capt. C. Loddiges; Capt. N. V. Lothian; Temp. Capt. R. H. Lucas; Temp. Capt. W. McConnell; Capt. H. E. McCredie; Capt. T. McEwen; Temp. Capt. J. M. MacFie; Temp. Capt. W. K. McIntyre. Temp. Capt. M. R. Mackay; Capt. K. MacLennan; Capt. F. D. Marsh; Temp. Capt. E. S. Marshall; Temp. Capt. J. F. Matheson; Temp. Capt. A. U. Millar; Capt. J. Miller; Temp. Capt. M. T. Morgan; Temp. Capt. R. S. Morshead; Capt. W. Murdoch; Capt. C. W. C. Myles; Temp. Capt. G. W. Parry; Temp. Lt. R. D. Passey; Temp. Capt. M. P. Paton; Lt. (temp. Capt.) J. H. Pendered; Capt. I. M. Pirrie; Capt. R. E. Pitts; Capt. L. T. Poole; Temp. Capt. G. R. B. Purce; Capt. A. Rankine; Capt. W. L. Robertson; Capt. C. J. Rogerson; Temp. Capt. G. W. R. Rudkin; Capt. E. U. Russell; Temp. Capt. W. H. Scott; Temp. Capt. L. H. Skene; Capt. E. C. Sprawson; Capt. C. S. Steddon; Capt. J. Swan; Temp. Capt. H. J. H. Symons; Temp. Capt. G. L. Thornton; Temp. Capt. R. Tindall; Capt. A. L. S. Tuke; Capt. B. Varvill; Capt. E. W. Vaughan; Capt. J. Walker; Temp. Capt. E. C. Wallace; Capt. J. H. Ward; Temp. Capt. H. F. Warwick; Temp. Capt. G. D. Watkins, D.S.O.; Temp. Capt. J. D. Watson, Temp. Capt. W. B. Watson; Capt. J. C. Watt, R.A.M.S.; Capt. W. J. Webster; Temp. Capt. L. McI Weeks; Temp. Capt. G. P. White; Temp. Capt. A. Wilson; Capt. A. F. Wilson; Capt. W. F. Wilson; Temp. Capt. C. Witts; Capt. W. V. Wood.

Australian Army Medical Corps.—Capt. K. McK. Doig; Capt. G. S. Elliott. Capt. (now Maj.) W. Evans; Capt. (now Maj.) R. H. Hudson; Capt. H. F. Maudsley; Capt. (now Maj.) L. May; Capt. (now Maj.) E. K. Parry; Capt. C. C. Simson; Capt. R. M. W. Webster.

Canadian Army Medical Corps.—Capt. H. C. Allison; Capt. C. P. Penwick; Capt. R. J. Gardiner; Capt. R. T. W. Herald; Capt. (now Maj.) A. L. Jones; Capt. H. W. Whytock.

New Zealand Army Medical Corps.—Capt. W. G. Borrie; Capt. (now Maj.) J. Connor; Capt. K. F. Gordon; Capt. F. N. Johns; Capt. J. K. Venables.

South African Army Medical Corps.—Capt. E. Hill.

Indian Medical Service.—Capt. Haji Sulaiman Gulam-Nossein Haji; Capt. M. J. Roche.

TREATMENT OF TUBERCULOUS EX-SERVICE MEN.

The Local Government Board has addressed a circular (5177) to county and borough councils recapitulating the regulations hitherto in force for the treatment of men discharged from the Navy or Army on account of tuberculosis. Under Section 4 of the National Insurance (Part I. Amendment) Act, 1917, the Insurance Commissioners have now extended sanatorium benefit to all invalided *uninsured* sailors and soldiers below the £160 income limit. The duty of providing for these no longer, therefore, falls directly on the councils, although it is open to Insurance Committees to arrange with councils for the necessary residential treatment, paying over in whole or in part the special grants available for such cases. Further, the Ministry of Pensions has undertaken to defray the cost of residential treatment where the patient's condition renders this desirable, even when restoration of useful working capacity is not to be expected. Councils are asked for a statement of the accommodation available for the last class mentioned.

AUXILIARY R.A.M.C. FUNDS.

At the conclusion of the first complete year of the existence of the Auxiliary R.A.M.C. funds a statement has been issued. The funds were initiated by the Director-General, Surgeon-General Sir Alfred Keogh, in June, 1916, a committee was formed in August, and circulars were sent out inviting subscriptions. These were sought first from officers of the Auxiliary Forces for the assistance of orphans of deceased officers who may have left their families in difficult circumstances, with a view to obtaining for the children a better education than would have otherwise been possible; this was termed the Benevolent Branch. Contributions were sought, secondly, from canteen and recreation funds for the Relief Branch, the sums to be employed for the immediate needs of widows and orphans of soldiers of the corps of the New Armies who have lost their lives during the war. All moneys received have been banked separately in the two branches, the accounts being kept distinct, and a considerable proportion of each total has been invested in Government securities. As regards the Benevolent Branch it was decided that in all cases assistance should be made by grants annually, such grants being renewable as circumstances required, but being always reviewed at each annual general meeting. The committee has been authorised to deal with urgent cases as they arise during the year by making small grants in advance, subject to the approval of the next annual meeting and also with the administration of the Relief Branch.

The first annual general meeting was held on Oct. 26th, and grants made from the Benevolent Branch as follows.

3	orphans of an officer with temporary commission			£30.
2	,,	,,	,,	£20.
2	,,	,,	,,	£40.
2	,,	,,	,,	£15.
4	,,	R.A.M.C. Territorial Forces		£30.
2	,,	,,	,,	£25.

Sir Alfred Keogh in September last addressed a personal letter to all Directors of Medical Services at home and abroad inviting their coöperation, and as a result the number of annual subscribers has greatly increased, the total at present exceeding 1200. The development and future success of the charity will therefore be assured provided that the corresponding annual subscriptions are continued, and it may be repeated that grants from these funds in no way take the place of any pension, compassionate allowance, or gratuities. Colonel W. Hale White, R.A.M.C T., has kindly undertaken the duties of honorary secretary, and the office will shortly be moved to 11, Chandos-street, Cavendish-square, W. 1, where all communications after Jan. 31st should be addressed.

OBITUARY OF THE WAR.

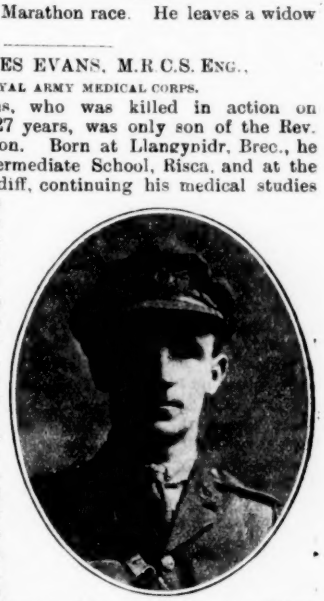
JAMES McDONALD MATHESON, M.B., CH.B. GLASG.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain J. M. Matheson, who was killed in action on Nov. 30th last, at the age of 27 years, was youngest son of the late William James Matheson, of Novar, Ross-shire, and was educated at Edinburgh Institution, studying medicine there, and at Glasgow University, where he graduated in 1916. He first saw some service with the Navy, later joining the R.A.M.C., and being sent first to Mesopotamia, and later to France. Captain Matheson had won success as an all-round sportsman at Edinburgh University, winning the Marathon race. He leaves a widow and two children.

WILLIAM JONES EVANS, M.R.C.S. ENG.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.



Captain W. J. Evans, who was killed in action on Sept. 13th last, aged 27 years, was only son of the Rev. W. Evans, of Risca, Mon. Born at Llangynidr, Brec., he was educated at the Intermediate School, Risca, and at the University College, Cardiff, continuing his medical studies at University College Hospital, London, with the intention of taking the M.B., B.S. Lond. On obtaining the qualifications of the Conjoint Board, however, he at once obtained a commission in the R.A.M.C., and after a brief period of training on Salisbury Plain went to France in May, 1916, attached to a field ambulance, from which he was later transferred to be medical officer to the Gloucester Regiment. He met his death by the explosion of a shell which wrecked his dug-out while he was in the act of ministering to the wounded. A medical colleague writes of Captain Evans: "He was of a generous disposition, always cheerful and warm-hearted, with an insight into human nature which enabled him to reckon up a man with unusual accuracy. At his medical work he was keen and up to date."

Obituary.

THEODORE C. JANEWAY, M.D.,

ASSOCIATE PROFESSOR OF CLINICAL MEDICINE IN THE JOHNS HOPKINS UNIVERSITY, BALTIMORE.

THE news of the death of Professor Theodore C. Janeway will prove a great shock to his numerous friends and admirers on both sides of the Atlantic. No details of his illness have been received, other than the fact that he died of pneumonia at Baltimore, Maryland, on Friday, Dec. 28th, 1917. He is survived by his mother, his wife, and five children, who will have the heartfelt sympathies of all their friends.

Professor Janeway was about 45 years of age, and was the son of Dr. Edward G. Janeway, a distinguished consultant physician of New York City, who died about 10 years ago, and was one of the leaders of the medical profession in the United States. After taking his degree at Yale University he studied medicine and graduated from the College of Physicians and Surgeons in New York. He became a teacher almost from the day of his graduation, and at various times was connected with the leading New York hospitals, including Bellevue, St. Luke's, and the Presbyterian. On the retirement of Dr. Walter James he was appointed to the Chair of Medicine at Columbia University, New York. Four years ago, when a liberal grant from the Rockefeller Foundation made it possible for the trustees of the Johns Hopkins University, Baltimore, to place the Chairs of Medicine, Surgery, and Pediatrics on a whole-time basis, Professor Janeway was called to occupy the Chair in Medicine in that University, a chair previously held by Sir William Osler and Professor L. F. Barker, and which he occupied at the time of his death. This decision on the part of the trustees of that institution initiated a new departure in medical education in the English-speaking world.

Professor Janeway was an enthusiastic investigator, and availed himself of the clinical material and laboratories in the various institutions he was successively connected with for carrying out the researches he became interested in. He was one of the pioneers in the study of the effect of disease on arterial blood pressure, and about ten years ago published an excellent volume on the subject. At the time of his death he was actively engaged on a revision of this work. His contributions to medical literature have been very numerous and important. He has published noteworthy papers on diabetes mellitus, dealing with the metabolism and treatment of the disease. In recent years he had been especially interested in the study of nephritis, utilising the newer methods of studying this disease, such as Ambard's coefficient, the estimation of the non-protein nitrogen in the blood, and the various forms of functional renal tests, as a means of determining the prognosis and of ascertainig the best dietetic treatment in each individual case. He published several papers on this important subject. As a member of the Board of Trustees of the Rockefeller Institute in New York he was keenly interested in the investigations carried on there by Cole and his associates concerning the various strains of the pneumococcus and the specific serum therapy of pneumonia, the disease from which he unfortunately himself succumbed.

Professor Janeway was also to the front in the popular fight against tuberculosis, and was ever ready to give his assistance in the campaign being waged against this devastating disease. His interest in this subject was further manifested by the part he took in the establishment of the Post-graduate School for the Study of Tuberculosis at Saranac Lake, New York, in memory of Dr. Trudeau, and by the fact that for the last three years he was president of the Laennec Society at the Johns Hopkins Hospital, Baltimore, a society organised there by Sir William Osler some 15 years ago for the study of tuberculosis. Before this society nearly all the leading students of tuberculosis in the United States have presented papers.

When the United States declared war on Germany in April, 1917, Professor Janeway was called into active service in the Army Medical Corps, of which he had been for several years a member. Until a week before the Johns Hopkins University Unit sailed for France in the latter part of June, 1917, it was his intention to go with the unit as chief of the medical division. His friends insisted, however, that he could probably serve his country better by remaining in the United States as head of the department of medicine in the Johns Hopkins University and in an advisory capacity to the Government. With considerable reluctance he was persuaded to remain, and since then, with the rank of major, he has occupied a desk in the office of Surgeon-General Gorgas at Washington, where his scientific training and organising ability have been of the greatest service to his country.

As a bedside teacher and clinical lecturer Professor Janeway had few equals. He was a fluent speaker and a clear thinker, and had a remarkable memory for recalling cases previously observed in order to elucidate phases of the particular subject under discussion. He possessed the admiration and devotion of all his friends and *confrères* in the University. In his death the Johns Hopkins University sustains a severe loss, especially at a time when a new departure in medical education was being given its first trial, and when every other important medical school in the United States was watching the experiment.

Professor Janeway's home life was charming. His was a devoted family. His house was a rendezvous for the younger medical men and for the senior medical students. All busy men usually find time for one or more hobbies. Professor Janeway was very fond of amateur photography and of music. For many years he had been accustomed to spend his vacations with his family at a delightful summer colony in the Adirondack mountains in Essex County, New York, where he was able to indulge himself in his chief exercise, that of long walks. Those who knew him well mourn a sincere and devoted friend, and our sympathies go out to every member of his family in their sorrow.

Sir William Osler writes:—

The death of this distinguished teacher from pneumonia, at the early age of 45, is a severe loss to scientific medicine, and, following so soon upon that of Dr. Mall, is another hard blow to the Johns Hopkins Medical School. Dr. Theodore Janeway's life justified a singularly fortunate birth and breeding. The son of an unusually able physician, Dr. Edward G. Janeway—a strong-fibred, honest man, who rose to the first rank in the United States—nature and nurture combined to make his path easy. Connected at first with the New York University, in 1909 he became professor of medicine at Columbia, and began a successful reorganisation of the methods of teaching and investigation. He collected able young assistants from different parts of the country, and it is not too much to say that by precept and example he put a new spirit into clinical medicine in New York. His "Clinical Study of Blood Pressure," published in 1905, admirably illustrated the application of physiological methods to bedside problems. With a first-class training and great energy he soon became recognised as the leader of the younger group of physiological clinicians who have been quietly but surely upbuilding and transforming American medicine. When in 1914 the Johns Hopkins Medical School accepted the Rockefeller bequest on condition that a certain number of the clinical professors should be whole-time, Dr. Janeway was naturally the choice in medicine. He entered upon a novel and untried position, but judgment is strongly in favour of the experiment as carried out by Dr. Janeway. With ample private means, rare constructive ability, and a keen capacity for research, there were combined in him all the elements for a successful whole-time teacher. He upheld and extended the ambition of the clinique to be not alone a school to train men in the knowledge of disease, but in the methods of dealing with its unsolved problems. The published work of the past three years shows that he and his pupils were engaged in the best type of clinical research. When the United States declared war he was among the first called to coöperate with Surgeon-General Gorgas in reorganising the medical department of a great civilian army. He became deeply interested in getting the young American physicians trained to meet the many novel conditions of practice in France, and only a few weeks ago the writer had a long letter from him full of plans and details. His death is a sad loss to us all—the cruelly premature death of a man who has a great work in hand.

FRANK OGSTON, M.D., C.M. ABERD.

Dr. Frank Ogston, who recently died at Dunedin, at the age of 71, was the younger son of the late Professor Francis Ogston, of Aberdeen, who held a high position in matters of medical jurisprudence and toxicology, and brother of Sir Alexander Ogston. After graduating at Aberdeen in 1873, he did some post-graduate work at Vienna, at Prague, where he studied under Professor Maschka and obtained the Austro-German official qualification in toxicology, and at

the University of Paris. On his return to Aberdeen he practised as assistant to his father, holding a lectureship at the University and acting as medico-legal examiner in Crown cases. In 1883 he was elected corresponding member of the Société de Médecine Légale, being the first Briton to receive this distinction. Dr. Ogston then migrated to New Zealand, where he was appointed lecturer on jurisprudence at Otago University, and was later district health officer until his retirement in 1910. At the outbreak of war he volunteered to resume his old position as health officer at Dunedin and was so engaged at the time of his death.

Correspondence.

"Audi alteram partem."

AN INTERESTING CASE ILLUSTRATING THE USE OF LANE'S PLATES.

To the Editor of THE LANCET.

SIR,—A short time ago some strange things were published about the inefficiency of Sir Arbuthnot Lane's bone-plates, the principal reason assigned for their failure being the alleged ephemeral duration of the grip of the screw in bone tissue. In my paper on the Fixation of Simple Fractures, published in the *Annals of Surgery*, January, 1915, I dealt fully with this travesty of fact, but a case operated on this morning probably deserves special mention.

A middle-aged man, a victim of chronic Bright's disease, received a traumatic fracture of right femur, and I plated the fragments 85 days ago. The wound healed by first intention, but firm union was delayed until the ninth week. Three weeks later, when I considered it safe to get him out of bed, the plate was exposed by a long incision through the original scar, was found covered in its entirety by periosteum, and was so intimately welded to the bone that the screw-driver had to be resorted to. The result was that the uppermost screw was quite loose (considerably oxidised) and came away easily; the second, third, and fifth required almost as much force for their removal as for their insertion. The fourth broke off at the head (a narrow circle of oxidation), leaving the shaft firmly planted in the substance of bone; strong pressure forceps, needle-holder, and sequestrum forceps were in turn applied in vain to the projecting portion (2 mm.); at last, at the suggestion of the theatre nurse, a spring-handled rongeur forceps was forcibly and firmly applied, and after four determined twists the screw came forth. I was considerably impressed with the normal appearance of the bone beneath the plate and in and around the screw-holes; there was not the slightest indication of any bone deterioration, of any change in colour, or of any deficiency in circulation. There was not a drop of serum or any other evidence of irritation either under or about the plate. To all intents and appearance it might have been a local anatomical institution. Indeed, it seemed something like supererogation to have interfered with such a solid physiological wound, a feeling rather emphasised by a temporary respiratory collapse (ether), necessitating artificial respiration, just as the dressing was applied.

I should have mentioned that firm union had taken place, with absolutely normal alignment, so much so that it was difficult to detect the old line of fracture, particularly as there was no trace of callus left.

I should think that the factors in this case—poor vitality and slow union in a patient afflicted with chronic Bright's disease, plus the retention of a large plate with five screws for 85 days in the tissues—constitute a fairly efficient test as to the practical longevity of Lane's screws.

I am, Sir, yours faithfully,

JOHN O'CONOR, M.A., M.D. T.C.D.,
Senior Medical Officer, British Hospital, Buenos Aires.

Nov. 12th, 1917.

THE INTERPRETATION OF CERTAIN ELECTRO-PHYSIOLOGICAL PHENOMENA.

To the Editor of THE LANCET.

SIR,—When Professor Bayliss criticised my work before the Royal Society of Medicine he based his criticism to some extent upon statements said to have been made by me. They were not made by me.

The report of my paper in your current issue inadvertently does me the same injustice. I am made to say that as we progress from the violet to the red end of the spectrum there is a discharge of electricity of ever-increasing intensity. This is nothing short of nonsense. I said—

"We are told upon the authority of Clerk-Maxwell and Sir Oliver Lodge that light is an electro-magnetic disturbance of the ether. Optics is a branch of electricity. I suggest for your consideration that the potential, the electromotive force, so to speak, of light must rapidly increase as we progress from the red to the violet end of the spectrum, and that there must be a discharge of electricity of ever-increasing intensity."

Trusting you will allow me to make this correction.

I am, Sir, yours faithfully,

West Norwood, S.E., Jan. 7th, 1918. A. E. BAINES.

BACK PRESSURE AS A CONSEQUENCE AND AS A CAUSE OF HEART FAILURE.

To the Editor of THE LANCET.

SIR,—With the line of argument pursued in Dr. Harrington Sainsbury's letter of Dec. 8th, 1917, under the above title I find myself in complete agreement. Indeed, in maintaining the importance of cardiac valvular competency in THE LANCET of June 16th, 1917, I stated some facts which form the substance of his demonstration of the existence and nature of that back pressure which is regarded as an obsolete conception by some, for reasons, as he remarks, "more than inconclusive." Agreeing, as I do, with him on the position he has so lucidly set forth in his letter, I should not have considered myself justified in again encroaching on valuable space in your journal on this topic, were it not to call attention to a point which is not, I believe, quite realised, and the recognition of which is of practical importance.

It may be questioned whether stasis in the capillaries and venules is not in certain circumstances largely an initial rather than final event, as Dr. Sainsbury regards it. I feel disposed, indeed, to maintain that the spasm of the arterioles with which for long we were familiar, as the incentive to cardiac embarrassment in certain cases (notably in those with anginal and anginoid attacks, which are relieved by the administration of nitrites) is, in most cases, a venule and capillary stasis, due to defective left ventricular action propulsive and aspirative, which the heart resents. In some cases it expresses such resentment by cardiac pain, and in all cases by an excited action which is primarily a natural effort at recovery of power. My reason for holding this view is that I have found the failing and embarrassed heart, prior to the period of complete and final collapse, to register a definite *rise*, not fall, of pressure. Such a rise on the recovery of ventricular power unquestionably falls when the phase of failure has passed or been ameliorated. Similarly, with more pronounced venule and capillary stasis, associated with anasarca and accompanied or not, as the case may be, with effusion into one or more serous cavities, drainage of the fluid and relief of venule and capillary stasis and compression, I have found to be associated with a quite definite fall both in systolic and diastolic blood pressure, and this with a general improvement and sense of restored comfort on the part of the patient.

This seeming paradox of increased blood pressure in a failing heart, of the existence of which anyone may convince himself, is only partly explained by the rescuing action of the accelerant and augmentor nerves upon the embarrassed organ. It is chiefly due to venous stagnation and serous overflow, which are attributable to what has quite intelligibly been termed "back pressure." Peripheral venule and capillary stasis may, however, exist without noticeable œdema, effusion being a later phenomenon. When œdema is absent stasis is indicated by augmented action of the heart associated with raised blood pressure, and it may also be by the presence of a small or large amount of albumin in the urine. Indeed, the static and transient albuminuria, so frequently found in young subjects, is rather indicative of a temporary cardiac inadequacy than due to an essentially local cause, and the subject evincing it has, for the time at least, to be treated with circumspection. In the pulmonary venous system, which is accessible to auscultation, the earliest indication of back pressure is to be found in the easily detected and *reversible* crepitation—the *œdème à bascule*

of the French—which I described more fully in THE LANCET of May 6th, 1911. It occurs at the pulmonary bases and usually first at the left base.

Back pressure may, therefore, largely commence at the systemic periphery, and, while itself the result of cardiac failure, it may hasten disability in proportion to the mechanical and vital perfection or imperfection of the central organ itself, which fails in face of the peripheral obstacle to propulsion. In its failure it entails stagnation in the whole preventricular circuit, which gradually adds the weight of the whole venous column to the obstacle opposing left ventricular propulsion of blood. These conditions constitute a "back pressure" which Dr. Sainsbury has aptly likened to the backward shot of the apparently retreating Parthian bowman. It supplied on occasion triumphs to the sanguinary therapeutics of our ancestors, which we are usually too timid to imitate. Writing of such a case, due to central obstacle (narrowing of the pulmonary artery and polypous concretions in the right auricle), Kinglake remarks (*London Medical Journal*, vol. x., part iv., 1789): "To describe the benefit gained by each bleeding would be to exhibit the difference between the most affecting pain and comparative ease." The case was under observation for two years and was bled to an average amount of 4 oz. on 312 occasions! Had the case had a sufficient opening in the inter-auricular wall, like a similar one recently related by me at the Anatomical Society, and who lived to the age of 72 years, many bleedings might have been saved and the patient have lived much longer with an obviated "back pressure" in his right heart and venous system.

I am, Sir, yours faithfully,

Upper Berkeley-street, W., Dec. 31st. ALEXANDER MORISON.

THE ADMINISTRATION OF BROMIDE.

To the Editor of THE LANCET.

SIR,—I have read Dr. Maurice Craig's letter on the bromides in your issue of Dec. 29th, 1917, with much interest and the points brought out are worthy of careful consideration. One statement occurs, however, which some may be disposed to question—viz., that the potassium salt is undoubtedly more efficacious than the other salts. This has not been my experience, and it is difficult on theoretical grounds to account, e.g., for the supposed greater efficacy of the potassium over the sodium salt. Administered orally, and given in the ordinary therapeutic doses the depressing effect of the K ion is, as Professor Cushny points out, not manifested, and it is practically as inert as the Na ion. The action of both bromides would therefore appear to depend solely upon the Br ion. Now, owing to the higher atomic weight of potassium, a given dose of sodium bromide will contain more bromide than that of the corresponding potassium salt. Sodium bromide should, therefore, if anything, be the more potent of the two. Theoretical considerations must, however, I admit, give way to results actually attained in practice, and one must acknowledge that the relative efficacy of these two bromides has never been satisfactorily settled. Many will, therefore, be grateful to Dr. Craig if he is able to bring forward any definite evidence which would help to resolve the question. From one's own experience one is inclined to think that the routine use of potassium bromide (due partly to its relative cheapness before the war) has led to an insufficient experience with the sodium salt.

I am, Sir, yours faithfully,

E. W. ADAMS,

Late Lecturer on Pharmacology, University of Sheffield.

Surbiton, Surrey, Jan. 9th, 1918.

THE LANCET, VOL. II., 1917: THE INDEX.

THE Index and Title-page to the volume of THE LANCET completed with the issue of Dec. 29th will be ready shortly. Owing to the increasing shortage in the paper-supply, the Index will not be issued with all copies of THE LANCET, as was the custom prior to the War. Subscribers who bind up their numbers are requested to send a post-card to the Manager, THE LANCET Office, 423, Strand, London, W.C. 2, when a copy of the Index and Title-page will be supplied free of charge.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At examinations for medical and surgical degrees, held recently, the following candidates were successful in the subjects indicated:—

SECOND EXAMINATION.

Part I., Human Anatomy and Physiology.—C. M. Billington, Caius; H. W. Briggs, B.A., Emmanuel; G. H. Oriel, B.A., Sidney Sussex; C. V. Patrick, Caius; J. H. Porter and H. Spibey, Downing; and M. L. Young, Caius.

THIRD EXAMINATION.

Part I., Surgery and Midwifery.—I. de B. Daly, B.A., Caius; R. French, B.A., Downing; A. R. Hargreaves, B.A., Trinity; C. E. Kindersley, B.A., Magdalene; J. G. Lawn, B.A., Sidney Sussex; H. Morrison, B.A., Caius; F. P. Nicholas, B.A., and A. G. Shurlock, B.A., Jesus; E. B. Verney, B.A., Downing; and C. H. Vernon, B.A., John's.

Part II., Medicine, Pathology, and Pharmacology.—V. M. Coates, M.A., Caius; E. T. D. Fletcher, B.A., Magdalene; R. French, B.A., Downing; R. J. Hearn, B.A., Jesus; S. Riddiough, M.A., King's; and W. T. Warwick, B.A., Emmanuel.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—The following lecture arrangements are announced for the next two months, the lecture hour being in each case 5 P.M. Professor Arthur Keith: Ten lectures on the Anatomical and Physiological Principles underlying the treatment of Injuries to Muscles, Joints, and Bones, on Jan. 14th, 16th, 18th, 21st, 23rd, 25th, 28th, 30th, and Feb. 1st and 4th. Professor J. Hutchinson: One lecture on the Surgical Treatment of Neuralgia, on Feb. 6th. Professor Percival P. Cole: One lecture on the Treatment of War Injuries of the Jaws and Face, on Feb. 8th. Professor Hildred Carlill: One lecture on the Diagnosis and Treatment of Syphilis of the Central Nervous System, on Feb. 11th. Professor William Wright: Two lectures on the Quaderni d'Anatomia by Leonardo da Vinci on Feb. 13th and 15th. Professor F. G. Parsons: One lecture on Research on the Structure of the English Skull on Feb. 18th. Professor E. K. Martin: Two lectures on Projectile Fracture of Limb Bones on Feb. 20th and 22nd. Professor W. T. Lister: One lecture on the Pathological Aspect of Certain War Injuries of the Eye on Feb. 25th. Fellows and Members of the College are invited to attend the lectures. Others will be admitted on presenting a visiting card.

PUBLIC HEALTH PROBLEMS UNDER WAR AND AFTER WAR CONDITIONS.—The fourth series of free lectures and discussions under this title will take place at the Royal Institute of Public Health, 27, Russell-square, W.C., at 4 P.M. on successive Wednesdays, beginning on Jan. 16th and ending on March 13th. The titles and lecturers in order are as follows: "The Problem of Birth Control, with special reference to the Public Health Aspect," by Dr. C. Killick Millard; "Some Constructive Suggestions in regard to the Proposed Ministry of Health," by Professor E. W. Hope; "The Reform of the Treatment of Mental Disorder," by Professor G. Elliot Smith; "What Steps are Possible to Improve the Teeth of the Nation?" by Mr. J. G. Turner, F.R.C.S.; "The Problem of Tuberculosis Under War and After War Conditions," by Sir Arthur Newsholme; "The Management of Venereal Disease in the Civil Community," by Lieutenant-Colonel L. W. Harrison, D.S.O.; "The Rôle of the Midwife in relation to the Nation's Health," by Lady Barrett, C.B.E.; "Town Planning in its relation to Public Health," by Professor S. D. Adshead; "Food in its relation to External or Useful Work," by Professor W. H. Thompson.

UNIVERSITY OF EDINBURGH.—The annual report for 1916–17 states that during the year the total number of matriculated students was 1887, of whom 1201 were men and 686 were women; in the Faculty of Medicine there were 949 (709 men and 240 women). The O.T.C. has been active, peace-time training having been carried on in the medical unit; the number enrolled was 42; a 15 days' camp was held. Forty medical commissions were given to cadets. The following degrees were conferred during the year: Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), 118; Doctor of Medicine (M.D.), 12. The total annual value of the University Fellowships, scholarships, bursaries, and prizes now amounts, in the Faculty of Medicine, to £5610. An Ordinance of the University Court instituting a Chair of Tuberculosis received in September the approval of His Majesty in Council, and the first occupant of the chair, Sir Robert W. Philip, M.D., entered upon his duties. An Ordinance has also approved the institution of a Chair of Chemistry in relation to Medicine. The degree of B.Sc. in the Department of Veterinary Science was conferred for the first time in October last. The elevation to the judicial bench of Sir Christopher N. Johnston, Parliamentary representative of the Universities of Edinburgh and St. Andrews, created a vacancy, which was filled by the appointment in August of

Sir William Watson Cheyne. Funds amounting to £18,000 were transferred to the University Court by the Royal Victoria Hospital Tuberculosis Trust for the foundation of the Chair of Tuberculosis.

TUBERCULOSIS SOCIETY.—A meeting of the Tuberculosis Society will be held on Monday, Jan. 21st, at 8 P.M., at the Royal Society of Medicine, 1, Wimpole-street, W., when a discussion on Farm Colonies in the Treatment of Tuberculosis will be opened by Sir Robert Philip, Dr. T. Dyke Acland, Dr. Noel Bardswell, and Mr. A. H. Macpherson.

INSTITUTE OF HYGIENE.—The first of a series of Food Saving Exhibitions, under the auspices of the Ministry of Food, will be held at the Institute of Hygiene, 33-34, Devonshire-street, London, W., and opened by Sir Arthur Yapp on Monday, Jan. 28th. It will deal specially with food values and dietetics.

THE LATE DR. E. S. BYASS.—Dr. Edgar Spry Byass, who died in London on Dec. 30th last, was for many years in practice at Cuckfield, Sussex, where, following in the footsteps of his father, he held a number of appointments, in addition to enjoying an extensive private practice. He took the M.B. degree at Edinburgh in 1867, and was an enthusiastic Volunteer.

THE PENAL REFORM LEAGUE.—The work of the Penal Reform League has been retarded in many ways owing to the war, but the seventh report (1914-1917) shows that, in spite of difficulties, much good work has been accomplished. In regard to juvenile delinquency, a committee was formed as the result of a conference held at Caxton Hall in February last, and a memorandum has been drawn up by that committee and published under the title of "A National Minimum for Youth." The recommendations include, amongst those immediately needed, mothers' pensions, day nurseries for children under 3, infant schools for those over 3, and children's day settlements on vacant land in the outskirts of large towns. Both the report, which contains some suggestions for penal reform submitted to the Russian Minister of Justice at his request, and the pamphlet, "A National Minimum for Youth," can be obtained from 68A, Park Hill-road, N.W. 3, price 3*d*. each.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

To be temporary Surgeons: J. E. Purves, J. A. Sterling, J. G. Gilruth, R. T. F. D. Roberts, G. Balsillie, J. G. McGregor-Robertson.

ARMY MEDICAL SERVICE.

Col. T. H. J. C. Goodwin, C.M.G., D.S.O., has been appointed Deputy Director-General on the retirement of Surgeon-General M. W. Russell, K.C.M.G., C.B.

To be temporary Colonels: Temp. Lieut.-Col. T. R. Elliott, Temp. Capt. O. Richards, D.S.O.

Temp. Col. Sir Alexander MacCormick (Colonel, Australian A.M.C.) relinquishes his temporary commission.

Lieut.-Col. H. M. Morton, D.S.O., to be temporary Colonel whilst employed as Assistant Director of Medical Services of a Division.

Temp. Major (acting Lieut.-Col.) A. E. Webb-Johnson, D.S.O. (Captain, R.A.M.C., T.F.), to be temporary Colonel.

G. E. Gask, D.S.O. (Major, R.A.M.C., T.F.) to be temporary Colonel.

ROYAL ARMY MEDICAL CORPS.

Major H. C. Hildreth, D.S.O., relinquishes the acting rank of Lieutenant-Colonel on re-posting.

To be acting Lieutenant-Colonels whilst in command of a Medical Unit: Major G. G. Tabuteau, Capt. C. M. Drew.

Temp. Major F. G. W. Deane, from Springburn and Woodside Central Red Cross Hospital, to be temporary Major whilst in charge of Leith War Hospital, Seafield.

Temp. Hon. Major T. M. Burn-Murdoch is transferred from Smithston War Hospital to Springburn and Woodside Central Red Cross Hospital.

Temp. Capt. W. T. Finlayson to be temporary Major whilst specially employed.

Temp. Capts. J. M. Macmillan and F. W. Broderick to be temporary Majors (without increased emoluments) whilst specially employed.

C. H. G. Ramsbottom to be temporary Major.

To be temporary Captains: A. S. Elliott (Canadian Army Dental Corps), Temp. Lieut. C. H. Lipsey (Canadian Army Dental Corps).

Late temporary Captains granted the honorary rank of Captain: R. B. Hennessy, R. T. Jones, J. H. N. F. Savy.

Temporary Lieutenants to be temporary Captains: T. Barbour, J. M. Inverarity, J. Langwill, T. E. Flitcroft, H. W. B. Ruxton, G. R. Phillips, J. S. Leslie, G. H. H. Almond, W. A. Wilson-Smith, W. O'Donnell, G. S. Gordon, W. J. Ashby, C. A. H. Gee, W. A. L. Marriott, J. McGarrity, B. Haigh, R. N. Pheasé, A. B. Lindsay, A. J. McNair.

W. T. Dobson, late temporary Lieutenant, is granted the honorary rank of Lieutenant.

Officers relinquishing their commissions:—

Temporary Captains (on appointment under the Ministry of National Service): R. McL. Veitch, H. H. Folker, D. J. G. Johnston, R. A. Jones, H. Case, S. J. Cullum, N. Smith.

Temporary Captains: R. Paul, A. F. Laird, M.C., G. J. Adams, B. C. Eskell, D. A. Warren, M.C., W. H. R. Rivers (on ceasing to be employed at Craigiockhart War Hospital), E. H. Sheehan (on account of ill-health contracted on active service), C. C. Beatty (on account of ill-health contracted on active service, and is granted the honorary rank of Captain).

Temporary Lieutenants: F. J. Lennan, T. J. McDonald (on account of ill-health, and is granted the honorary rank of Captain), W. Laird.

TERRITORIAL FORCE.

Major (acting Lt.-Col.) P. R. Ash relinquishes his acting rank on alteration in posting.

To be Majors: Surg.-Major R. B. Purves, from the Yeomanry, and Capt. A. B. Whitton.

Capts. G. B. Jameson and E. F. Skinner resign their commissions on account of ill-health contracted on active service, and are granted the honorary rank of Captain.

Capt. E. D. Macnamara is restored to the establishment.

Capt. A. Jubb to be acting Major whilst specially employed.

Capt. F. G. Armstrong is seconded for duty with a General Hospital.

J. P. Henderson to be temporary Captain, Kent Medical Volunteer Corps.

TERRITORIAL FORCE RESERVE.

To be Majors: Major (Hon. Surg.-Lieut.-Col.) F. V. Adams, from R.A.M.C.; Major S. Lodge, from R.A.M.C.; Major W. L. Martin, from R.A.M.C.

To be Captains: Capt. J. Buckner, from Field Ambulance; Capt. H. R. Parsloe, from Casualty Clearing Station.

Capt. R. G. Wills relinquishes his commission on account of ill-health, and is granted the honorary rank of Captain.

INDIAN MEDICAL SERVICE.

Lieutenant-Colonel to be Colonel: J. Garvie.

Lieutenants to be Captains: J. W. Pigeon, M. L. Treston, P. Vieyra, Bhamini Moham Mitra, P. Savage, Amir Chand, R. Lee, Nilkanth Shriram Jatar, Tadepally Sankara Sastry, Jamal-ud-din, Ferozeshah Bapuji Chenoy, Sadanala Bashiam Venugopal, C. de C. Martin, J. H. Smith.

Temporary Lieutenant to be temporary Captain: Sorab Kaikhashree Engineer.

The undermentioned have been granted the temporary rank of Lieutenant: Sorabji Fardunji Bisni, Wilfrid Valladares, Framroz Dhunjibhoy, Gajanan Mukund Bhurke, Madhav Vithal Pathak, Burjorji Hormasji Kamakaka, Joseph Francis de Souza, Sailendra Nath Chandra, Joseph Augustine Pereira, Manuel Joseph Saldanha, Nilkanthe Anant Dalvi, Kumud Behari Chowdhury, Nitya Nand Joshi, Navai Maneckji Pestonji Dotivala, Dattatraya Mahadeo Bhatavadekar, Govind Shivram Mandlik, Nasarvanji Kavasji Arjani, Madan Mohan Maitra, Har Gobind Dayal Mathur, Lalit Mohan Banerjee, Banwari Lal Gupta, Hari Kishan Dikshit, Antonelli Saldanha, Chaudhari Gopi Nath Singh, Narayan Waman Modak, Ram Chandra, Henry Saumarez Hensman, Nishi Bhushan Mukharji, Lala Gurdas Ram, Palathnikal Varkey Cheriyan, Vishwambhar Prabhakar Limaye, Durgadas Sanyal, William Martin D'Souza, Gursaran Singh, Mool Singh Bazaz, Mohim Lal Deb, Ram Singh Sharma, Dwarka Parshad Bhargava, Uprenda Mohan Gupta, Jacob Ezekiel, Daniel John, Amar Nath Sharma, Munshi Fazul-ud-din, Kedar Nath Goyal, Tottakat Krishna Menon, Phanindra Nath Basu, Arunjay Sahay Varma, Hakim Ahmad Alavi, Jatindra Mohan Sikdar, Subodh Chandra Bhattacharya, Kalandi Manakadan Anantan, Prabhat Kumar Bardhan, Phanibhusan Mukerjee, Ullal Ananttbaya, Nil Mani Pal, Paresh Chandra Guha, Hiranya Kumar Sen, Bholabhai Bhogilal Shah, Hem Chandra Mitter, Ramesh Chandra Basu, Gopal Chandra Ray, Nilambur Phani, Bidhu Bhusan Mallik, Praphula Ranjan Gupta, Louis Castellino, Hiranand Tolaram Hathiramani, Bayaram Shavakshah Tarapore, Gulvadi Ram Dinker Rau, Baldeo Singh Gill, Surendra Prasad Das, Ajit Kumar Sen, Nripendranath Basu, Shankar Lal, Nusserwanji Framji Master, Kumudini Kanta Banarji, Narendra Nath Chatterjee, Pramatha Nath Sen, Jatindra Nath Bal, Sita Nath Ghosh, Nripendra Nath Chatterjee, Christian John Prabhaker, Hirji Dorabji Gimi, Haris Chandra Sen, Pande Uma Shankar, Dabir Ud-din Ahmad, Sachindra Nath Banerjee, Angelo Maria Freitas, Nand Kishor, Girish Chandra Maitra, Sham Lal, Daulat Ram Bhatia, Ratan Chand Sondhi, Lachman Das, Jitendra Nath Ray, Vishnu Tatyaji Korke, Dwijendra Nath Bhaduri, Bijitendra Basu, Jatindra Mohan Mukharji, Sundar Lal Bhandari, Kaikhushroo Hormusji Elchidana, Khagendra Mohan Basu, Narendra Nath Ghosh, Pramatha Nath Mallik, Bejoyananda Sen Gupta, Nalini Kanta Sirkar, Pashupati Basu, Chuni Lal Nandi, Amulya Charan Pal, Jitendra Kumar Banarji, Anil Krisna Mukerji, Latit Prosad Ghosh, Kshitish Chandhra Mitra, Rash Behari, Datta, Bama Charan Munshi, Sidhi Charan Mitter, Dhirendra Lal Sarkar, Jitendra Mohan Ghosh, Bhupendra Nath Chaudhuri, Narendranath Ghosh, Upendra Nath Das, Mohannath Kedarnath Dixit, Moses Solomon, Fidelis Conceicao, Surendra Nath Ghosh, Chhaganlal Motichand Contractor.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN, LIMITED, London.
The Way Forward: Three Articles on Liberal Policy. By Gilbert Murray. With a Preface by the Right Hon. Viscount Grey of Fallodon. 1*s*. net.
The Other War. Being Chapters by John Hilton, P. H. Kerr, Alec. Loveday, Harold Mess, and Joseph Thorp on Some Causes of Class Misunderstanding. Price 1*s*. net.
Visits to Walt Whitman. By J. Johnston, M.D., and J. W. Wallace. 6*s*. net.

BLACKWELL, B. H., London.
Wheels, 1917: A Second Cycle. 2*s*. 6*d*. net.

CLARENDON PRESS, Oxford.
Studies in the History and Method of Science. Edited by Charles Singer. 21*s*. net.

COLE AND CO., 92-96, Vauxhall Bridge-road, S.W.
The Cause, Prevention and Treatment of Cancer and other Disease By Lieutenant-Colonel W. H. Hildebrand, late Indian Army (retired).

FAULKNER, C. W., AND CO. (Printers), 79, Golden-lane, E.C.
A History of No. 7 (Queen's) Canadian General Hospital.

HARVARD UNIVERSITY PRESS, and HUMPHREY MILFORD, London.
Harvard Health Talks: An Adequate Diet. By P. G. Stiles, Ph.D. 2*s*. 6*d*. net.
Harvard Health Talks: Adenoids and Tonsils. By A. Coolidge, M.D. 2*s*. 6*d*. net.

Appointment.

DIXON, H. B. F., M.C., Captain, R.A.M.C., has been appointed Resident Medical Officer to the Leopardstown Park Home of Recovery for Discharged Neurasthenic Sailors and Soldiers.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

ALNWICK INFIRMARY.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

AUSTRALIA, COMMONWEALTH OF.—One Biochemist, salary £450; Two Senior Bacteriological Technical Assistants, salary £336; and Three Bacteriological Technical Assistants, salary £216 per annum.

BIRKENHEAD, BOROUGH HOSPITAL.—Junior House Surgeon. Salary £170 per annum, with board, &c.

BIRMINGHAM CITY EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £300 per annum.

BIRMINGHAM (NEAR), ROMSLEY HILL SANATORIUM.—Assistant Medical Superintendent, unmarried. Salary at rate of £350 per annum, with board, &c.

BOURNEMOUTH, ROYAL VICTORIA AND WEST HANTS HOSPITAL, Poole-road.—Resident House Surgeon for six months. Salary £350 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

COVENTRY AND WARWICKSHIRE HOSPITAL.—House Surgeon. Salary £300 per annum, with board, &c.

GREAT NORTHERN CENTRAL HOSPITAL, Holloway, London, N.—Honorary Medical Officer.

HASTINGS, EAST SUSSEX HOSPITAL.—House Surgeon. Salary £150 per annum, with board, &c.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 40, Grove End-road, N.W.—Resident Medical Officer, unmarried, for six months. Salary £250 per annum, with board, &c.

LIVERPOOL, BROWNLOW HILL POOR-LAW HOSPITAL.—Resident Assistant Medical Officers. Salary at rate of £300 per annum, with rations, &c.

LIVERPOOL, DAVID LEWIS NORTHERN HOSPITAL.—House Surgeon for six months. Salary at rate of £150 per annum, with board, &c.

MANCHESTER COUNTY ASYLUM, Prestwich.—Locum Tenens. Salary £7 7*s.* per week, with board, &c.

PORTSMOUTH, WORKHOUSE INFIRMARY, WORKHOUSE, AND CHILDREN'S HOME.—First Assistant Medical Officer. Salary £300 per annum, with rations, &c.

PUTNEY HOSPITAL, Lower Common, Putney, S.W.—Resident Medical Officer. Salary £150 per annum, with board, &c.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—Temporary Medical Officer as Surgeon. Salary £25 per annum. Also House Surgeon for six months. Salary £100 per annum, with board, &c.

ROCHESTER, KENT, ST. BARTHOLOMEW'S HOSPITAL.—Resident Clinical Assistant. Salary at rate of £110 per annum, with board, &c.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Female Medical Registrar.

SALFORD ROYAL HOSPITAL.—Honorary Assistant Surgeon.

SALFORD UNION INFIRMARY.—Resident Second Assistant Medical Officer, unmarried. Salary £300 per annum, with rations, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

STAFFORDSHIRE, WOLVERHAMPTON, AND DUDLEY JOINT COMMITTEE FOR TUBERCULOSIS.—Two Senior Tuberculosis Officers. Also Two Assistant Tuberculosis Officers. Salaries £500 and £350 respectively.

SWANSEA EDUCATION COMMITTEE.—Assistant School Medical Officer. Salary £350 per annum.

TOTTENHAM EDUCATION COMMITTEE.—Temporary Assistant Medical Officer.

VICTORIA HOSPITAL FOR CHILDREN, Tite-street, Chelsea, S.W.—House Surgeon for six months. Salary at rate of £200 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Holywell, Flint.

Births, Marriages, and Deaths.

BIRTHS.

BARON.—On Dec. 31st, at Platts-lane, N.W., the wife of Lieutenant A. E. Baron, R.A.M.C., of a son.

HARDWICKE.—On Jan. 4th, 1918, at 3, Heath Close, Hampstead Way, to Joan, wife of Captain E. C. Hardwicke, R.A.M.C.—a daughter.

HEALD.—On Jan. 3rd, at Grafton, Weybridge, the wife of Captain C. B. Heald, R.A.M.C., of a daughter.

MARRIAGES.

MICHELMORE—SCOTT.—On Jan. 3rd, at St. Saviour's, Torquay, George Michelmore, M.R.C.S., L.S.A., to Kathleen, daughter of Mrs. Scott, of Brabourne, Rowdens-road, Torquay, and the late James B. Scott, of Caterham.

DEATHS.

FIELDEN.—On Jan. 5th, at Bishop Auckland, Samuel Fielden, M.D., J.P., aged 80 years.

MILLAR.—On Dec. 31st, at Oriel Cottage, Helensburgh, N.B., Samuel Smith Millar, M.D., late of Enfield, Middlesex, aged 90

PHILLIPS.—On Jan. 5th, at Meols-drive, Hoylake, Cheshire, Edward James Montagu Phillips, M.R.C.S., L.R.C.P., L.D.S.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, Jan. 15th.

GENERAL MEETING OF FELLOWS, at 5 P.M.
Ballot for the Election to the Fellowship.

MEETINGS OF SECTIONS.

Wednesday, Jan. 16th.

HISTORY OF MEDICINE (Hon. Secretaries—J. D. Rolleston, Charles Singer): at 5 P.M.
Papers: Dr. R. W. Leftwich: Shakespeare's Medical Son-in-law, Dr. John Hall.
Mr. D'Arcy Power: Dr. John Halle (of Maidstone).
Exhibition of Books, Pictures, &c. (at 4.30 P.M.).

Thursday, Jan. 17th.

DERMATOLOGY (Hon. Secretaries—J. E. R. McDonagh, Henry MacCormac; Hon. Acting Secretary—S. E. Dore): at 5 P.M.
Cases will be shown.

Friday, Jan. 18th.

ELECTRO-THERAPEUTICS (Hon. Secretaries—E. P. Cumberbatch, Robert Knox): at 8.30 P.M.
Lieutenant H. M. Johnston, R.A.M.C., and Captain Kelsey Fry, R.A.M.C.: Demonstration of Lantern Slides and Radiographs to illustrate the Technique employed in the Radiography of Injuries of the Lower Jaw (Mandible). (From the Queen's Hospital, Sidcup).
There will be an Exhibition of Interesting Negatives and Prints, including Stereoscopic Plates of Injuries of the Lower Jaw.
Mr. E. E. Burnside will describe and demonstrate:—(a) A new Portable Snook Apparatus; (b) A new Transformer for the Heating Current of a Coolidge Tube.
Exhibition of Stereoscopic Radiographs to illustrate the Anatomy of the Fallopian Canal.
Fellows and Members wishing to show negatives or prints, or to take part in the discussions, are invited to communicate with the Honorary Secretaries.
Fellows and Members of other Sections are cordially invited to attend the meeting and to take part in the discussions.

ILLUMINATING ENGINEERING SOCIETY, House of the Royal Society of Arts, John-street, Adelphi, W.C.
TUESDAY.—5 P.M., Paper:—Mr. L. Gaster: Ten Years of Illuminating Engineering: its Lessons and Future Prospects.

ROYAL STATISTICAL SOCIETY, 9, Adelphi-terrace, Strand, W.C. 2.
TUESDAY.—5.15 P.M., Paper:—Mr. J. C. Spensley: Urban Housing Problems.

ROYAL MICROSCOPICAL SOCIETY, 20, Hanover-square, W. 1.
WEDNESDAY.—8 P.M., Presidential Address:—Mr. E. Heron-Allen: The Royal Microscopical Society during the Great War—and After.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
Course of Ten Lectures on the Anatomical and Physiological Principles underlying the Treatment of Injuries to Muscles, Joints, and Bones:
MONDAY, WEDNESDAY, AND FRIDAY.—5 P.M., Lecture I., II., and III.:—Prof. A. Keith.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Arthur Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Arthur Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.
TUESDAY.—4 P.M., Dr. J. L. Bunch: The Treatment of Nævi.
THURSDAY.—5 P.M., Chesterfield Lecture:—Dr. M. Dockrell: Tuberculosis of the Skin and Lupus Erythematosus.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Offices: 423, STRAND, LONDON, W.C. 2.

MANAGER'S NOTICES.

TO SUBSCRIBERS IN THE UNITED STATES.

Messrs. Wm. Wood and Co., of New York, have relinquished their Agency for the supply of THE LANCET in the United States. The Manager of THE LANCET will be pleased to supply copies direct from the London Office to subscribers in the United States at the strictly prepaid rate of $8 for twelve months. Subscriptions may commence at any time. Drafts and Money Orders should be made payable to the Manager, Mr. CHARLES GOOD, 1, Bedford-street, Strand, London, W.C. 2, England.

SUBSCRIPTION RATES.

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Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C. 2.

ADVERTISEMENT RATES.

Books and Publications ... ...
Official and General Announcements
Trade and Miscellaneous Advertisements ... ... } Four lines and under ... ... 4s. 0d.

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Entire Page, £8.
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Notes, Short Comments, and Answers to Correspondents.

TRIPLEX GLASS.

To the Editor of THE LANCET.

SIR,—Some three or four years ago I was introduced to triplex glass (which consists of two plates of glass with an intervening layer of celluloid) as a substance that would not break and splinter, and cause wounds more or less serious such as those caused by ordinary glass. It was recommended for spectacles, and before prescribing it for that purpose I subjected it to a practical test.

I fixed three lenses on a deal board and fired at them with a 12-bore gun choked in both barrels, loaded with No. 5 shot, from a distance of 35 yards. All three lenses were more or less starred and broken into irregular granules, but there were no splinters, sharp points or angles, nor were any fragments broken out of the lenses, and no shot went through them. I afterwards for sake of comparison treated a piece of ordinary window glass and a wine bottle in the same way; the glass was smashed to pieces and splinters were scattered all about, the shot perforated it and lodged in the board behind it, and the bottle had a large hole knocked in it and was splintered and cracked nearly in half.

I have for some time now advised everyone who has to wear glasses for distance, especially those who shoot, to have them made of triplex glass. They are certainly a useful protection against injuries from small foreign bodies, such as shot, and, as far as I am able to judge, there is no difference in refraction between triplex and ordinary glass; but I am told there is a difficulty about very deep concave lenses because of the division between the two layers of glass which may be opened in the

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Y.—York, Medical Officer of Health of.

(*Continued at foot of next page.*)

grinding. Further, such lenses are so thin in the centre as to greatly diminish or entirely annul their protective value. Both of these faults can easily be remedied by grinding the lens in ordinary glass and placing a fairly thick flat plate of triplex glass in front of it. It seems to me that every soldier on active service who has to wear glasses, whether for visual reason or protection, should have them made of triplex glass, and I recommend it to every one of them who consults me. I have no doubt that their use would prevent a very large percentage of the injuries to the eye caused by small fragments of projectiles, stones, hard earth, splinters of wood, bricks, &c., scattered broadcast by shell-bursts. I would further advise all owners of motor-cars who have a due regard for their own safety to have their screens and windows of triplex glass.

Only a few weeks ago a colleague of mine at the County of London War Hospital had his wind screen broken by a man with a stick; a splinter of glass struck him in the eye, which was so badly injured that it had to be removed. Had his screen been made of triplex glass I have no hesitation in saying that he would have had two eyes to-day. The most that would have occurred would have been a star in the glass; there would have been no splintering or flying fragments. It is also a matter that should be considered by the Board of Trade or other authority whether the use of triplex glass for windows and all parts of public conveyances for which glass is used—whether cabs, omnibuses, railway carriages or anything else—should be made compulsory. If this were done we should not see in the account of a collision between two omnibuses or other street conveyances, or of railway accidents, that a great number of the injured have been more or less severely cut by glass.

I am, Sir, yours faithfully,

Brook-street, W., Dec. 31st, 1917. CHARLES HIGGENS, F.R.C.S.

HYPOLOID SCOPOLAMINE HYDROBROMIDE.

Messrs. Burroughs, Wellcome, and Co., of Snow Hill buildings, London, E.C., have introduced two "hypoloids" containing the amounts respectively of 1/150 grain and 1/450 grain of scopolamine hydrobromide, the usual strengths employed (1) for initial injection, and (2) for subsequent use in producing narcosis in childbirth. The alkaloid salt is dissolved in 0·5 c.cm. sterile solution contained in a hermetically sealed glass phial. These preparations are additional to "hypoloid" scopolamine hydrobromide 1/130 grain and the tabloid hypodermic product of hyoscine hydrobromide. The convenience of having ready for immediate use the drugs prepared in this way, which can be relied upon as to dosage and sterile condition, is obvious.

CONVERTING GRAINS INTO GRAMMES.

To the Editor of THE LANCET.

SIR,—In the list of factors for converting from one scale to the other we find that the rule is "to convert grains into grammes multiply the grains by 0·0648." Instead of doing this I find that multiplying the grains by 8, and 8 again, one place to the left, and pointing off four places gives the correct answer. For example: 12 grains to grammes. That is, 12×8, plus 96×8 moved one place to the left, and the sum pointed off four places to left, gives answer 0·7776. If there were one or two decimal points in the original multiplicand these would have also to be pointed off to the left. For instance, if it had been 12·5 or 12·45 grains, the final sum would have been pointed off five places or six places to the left. I have not seen this simple method mentioned anywhere, although it is obvious on close inspection of the multiplier 0·0648, for the unit figure is 8 and the next two figures 64—that is, 8 times 8.—I am, Sir, yours faithfully,

Jan. 1st, 1918. F.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Jan. 9th, 1918.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Jan. 3	...	45	36	30	32	33	Cloudy
,, 4	...	45	38	24	26	26	Cloudy
,, 5	...	45	41	25	36	36	Overcast
,, 6	...	41	40	32	33	33	Cloudy
,, 7	0·02	52	38	33	36	37	Overcast
,, 8	0·17	46	28	25	26	26	Cloudy
,, 9	...	42	38	19	25	25	Cloudy

(Continued from previous page.)

Letters, each with enclosure, are also acknowledged from—

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